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December 11, 1972

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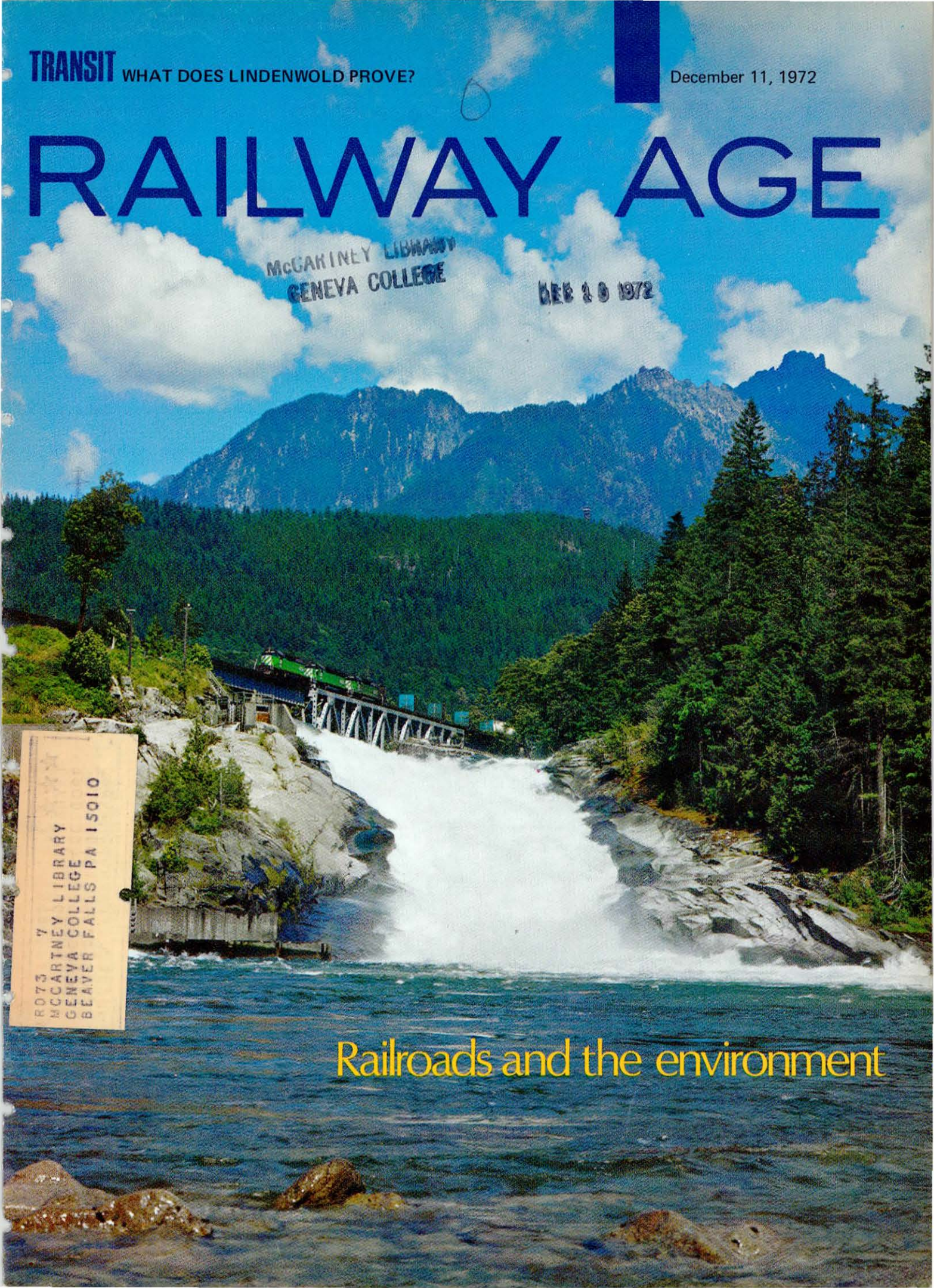

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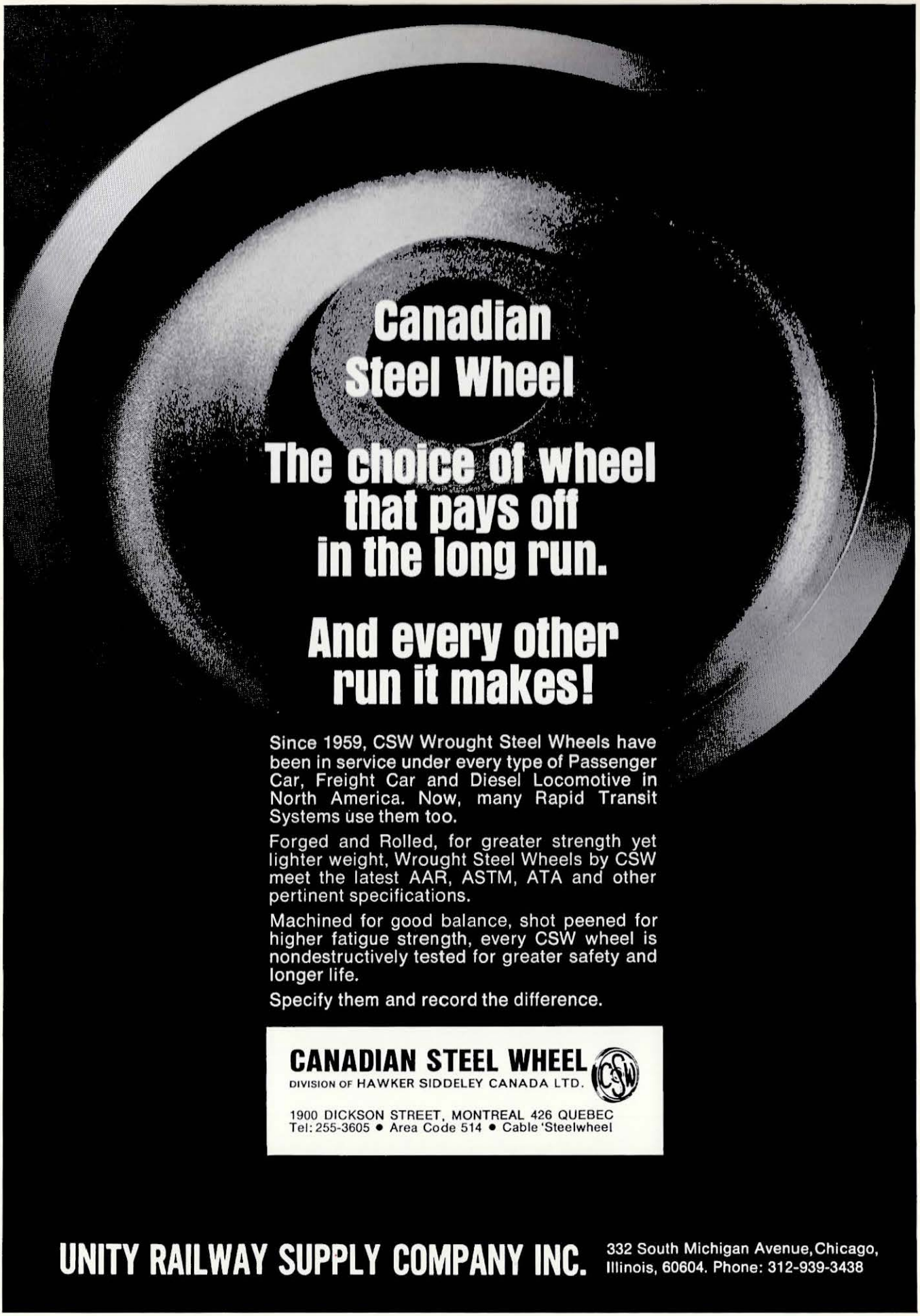
Railroads and the environment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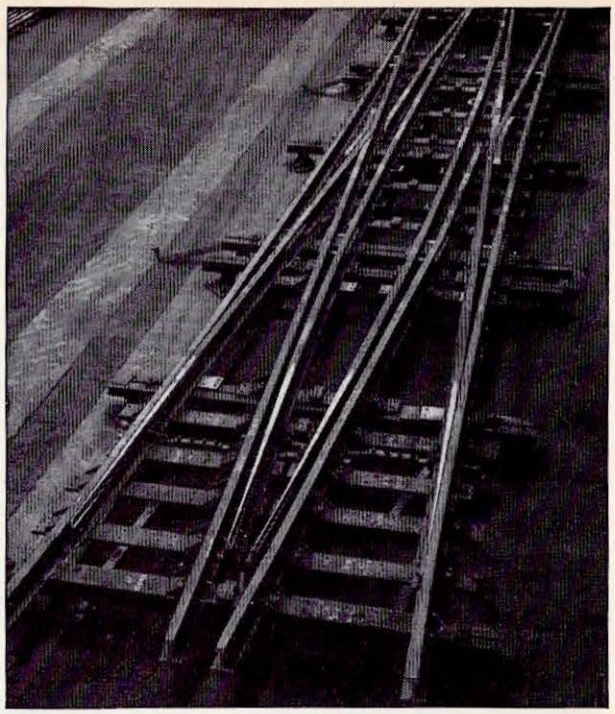

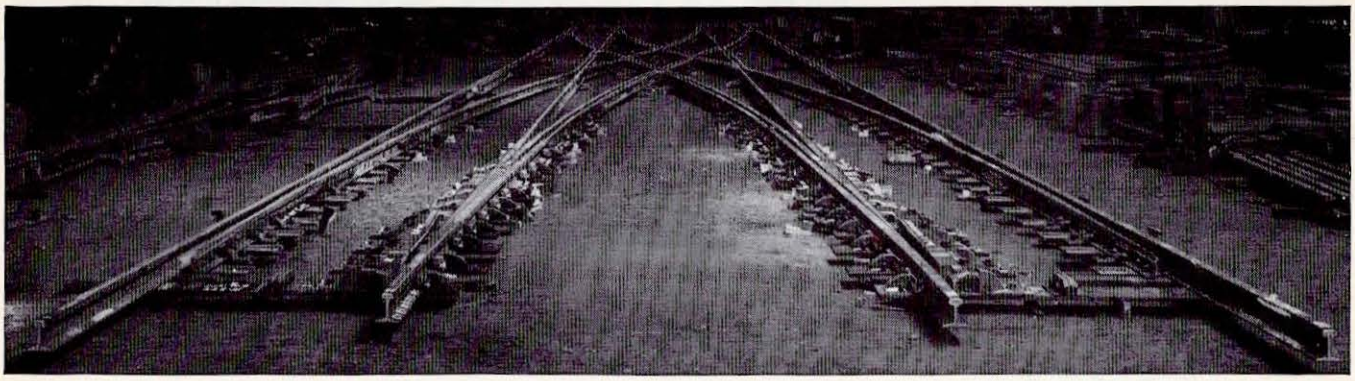

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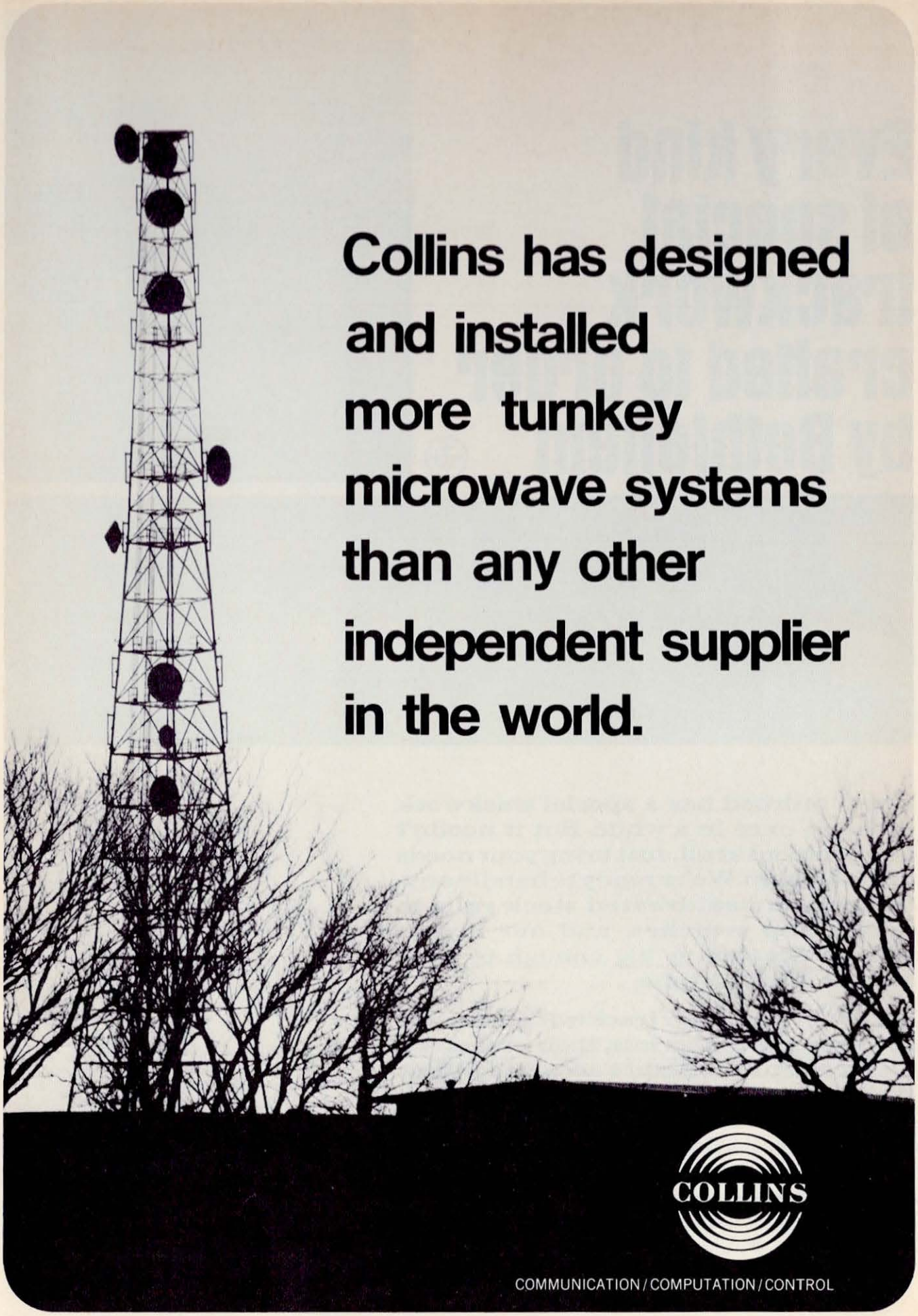

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RAILWAY AGE

December 11, 1972 • Vol. 173 No. 11

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Railway Age, established in 1856, is indexed by the Business Periodicals Index and the Engineering Index Service. Name registered in U.S. Patent Office and Trade Mark Office in Canada.
Published semi-monthly by the Simmons-Boardman Publishing Corporation, 508 Birch St., Bristol, Conn. 06010.
Railroad employees' subscription rate, U.S. possessions, Canada and Mexico, $6 one year, $9 two years, all others $15 for one year, payable in advance and postage paid. To railroad employees elsewhere in the western hemisphere, $10 a year; in the eastern hemisphere, $15 a year. Single copies 60¢, except special issues.
Address all subscriptions, change of address and correspondence concerning them to Subscription Dept., Railway Age, P.O. Box 530, Bristol, Conn. 06010.
Change of address should reach us three weeks in advance of next issue date. Send old address with new enclosing, if possible, your address label. Post Office will not forward copies unless you provide extra postage.

Member of ABC RPI

Circulation Dept.: John Rogers Director of Circulation, 350 Broadway, New York, N.Y. 10013. POSTMASTER—SEND FORM 3579 TO P.O. BOX 530, BRISTOL, CONN. 06010.

Printed at the Hughes Printing Co., 34 North Crystal St., East Stroudsburg, Pa. 18301. Second-class postage paid at Bristol, Conn., and at additional mailing offices.

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Inside

LUTHER MILLER

ENVIRONMENTALLY SPEAKING

Our office copy of Bartlett's contains only one "famous quotation" relating to environment, and it is this: "There's many a life of sweet content/whose virtue is environment." Now certainly Walter Learned (1847-1915) did not have the railroads in mind when he composed his couplet; but up until very recently he might well have. It is a fact that railroads have done far more to protect the environment than to assault it. Railroads are not paving over the countryside from sea to polluted sea; railroads are not spreading noxious fumes over field and dale; railroads are not shattering the air with jet blasts. Whenever a ton of freight moves by rail rather than by highway, whenever a passenger boards a train instead of his own automobile or an airplane, the environment is that much better off.

But virtue is rarely its own reward, and railroads today, despite their excellent record, are under intense pressure to improve on that record.

How railroads are now attempting to do just that is the subject of this week's cover story by Senior Editor Gus Welty (p. 19).

Compiling comprehensive and timely information in a still new and controversial field was not an easy task—mainly because the task the railroads themselves face is not an easy one. There is a maze of often conflicting regulations, actual and proposed. Some are nothing short of ludicrous. For example, Gus suggests, "At some point government will have to recognize that there is no sense in setting emission standards that the newest locomotives can't meet and in then trying to enforce standards when enforcement would shut down every railroad subject to the requirements." And Gus wonders if it really makes sense to try to legislate railroad noise levels below those which a good healthy snore would produce.

There are other brow-wrinkling problems—for example, the distinct probability that today's environmental solutions can become tomorrow's environmental concerns.

Gus examines these problems, and reports on how the railroads are organizing to combat them, today and tomorrow.

NIXON PICKS AN OIL MAN FOR DOT

President Nixon's Dec. 7 announcement that an oil company executive, Claude S. Brinegar, will succeed John A. Volpe as secretary of transportation sent railroaders scurrying to their Who's Whos. It told them little except that Brinegar, who will be 47 Dec. 16, is a senior vice president of Union Oil Co., has a Ph. D. in economics from Stanford, and is something of a writer/teacher. Remembering that Volpe, a highwayman, became a staunch friend of railroads, railroad men were not distressed that an oil man now has the job. Said one: "Any bending over backwards will have to be in our direction."

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RAILWAY AGE

DECEMBER 11, 1972

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The cover photograph shows a westbound Burlington Northern freight train rolling across bridge 1744.0 spanning the Skykomish River near Sunset Falls in Washington's Cascade Range. It was taken by Bob Harr of Hedrich-Blessing for BN.

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Short and Significant

EXHIBIT AND MEETINGS RESCHEDULED

New dates have been set for the 1974 exhibit of the Railway Engineering-Maintenance Suppliers Association and the annual meetings of the Roadmasters and Maintenance of Way Association and the American Railway Bridge & Building Association. The REMSA exhibit, to be held at the International Amphitheatre in Chicago, will run Sept. 29-Oct. 3, 1974. Meeting dates will coincide, and the meetings are now to be held at the Palmer House instead of the Conrad Hilton as originally planned.

NW WILL ABANDON ABINGDON BRANCH

Norfolk & Western has asked the ICC for permission to abandon the 56-mile line extending from Abingdon, Va., to West Jefferson, N.C. R.B. Claytor, NW executive vice president, says the road handled an average of 11 carloads a week on the line during the 12-month period ended June 30, 1972. He said the railroad "from time to time" has been approached by a number of individuals and groups interested in acquiring the line for seasonal excursion operations and possible assumption of common carrier freight obligations—but the last group interested, after four months of negotiations with NW, decided that anticipated freight levels would not cover estimated costs.

GRIFFIN TO EXPAND WHEEL-TREATING

In response to a demand for more rim-treated wheels brought on by the steady shift toward larger and heavier freight cars, Griffin Wheel Co. will double the capacity of heat-treating and quenching facilities at its Bensenville, Ill., plant. C.P. Voll, Griffin president, said that the new line would feature an 80-foot wheel conveyor system, three rim-quenching units and expansion of the plant's existing gas-fired draw furnace. Completion is scheduled for shortly after mid-1973.

PC PARES ITS OPERATING LOSS

Penn Central on Nov. 27 reported an operating loss of $8.6 million for October, compared with a net loss of $25.4 million in October 1971. The net loss for this October was $7.2 million, after an extraordinary credit due to a readjustment of losses resulting from the Agnes floods. For the first 10 months of this year, PC reported a net loss of $183.2 million, after extraordinary charges of $17.9 million, compared with a net loss of $220.9 million for the like 1971 period. Meanwhile, PC's trustees announced they would reveal their final reorganization plan on April 1, 1973.

$9 MILLION FOR "A BETTER WAY"

Santa Fe is budgeting close to $9 million to modernize and centralize its rail-welding operations. Included will be more than $5 million for construction of a welding plant near Amarillo, Tex., and installation of traffic control signaling between Amarillo and the plant, about $3 million for construction of four new rail-trains and almost $1 million for modernization of handling facilities for related material at Newton, Kans. The new facility is expected to go into operation next November; at full operation it will have capacity for welding 430 track miles of rail annually. Santa Fe now has 4,300 miles of welded rail, and has installed nothing but welded rail in mainlines and branchline relay programs since 1956.

AMTRAK FILES BRIEF ON RAIL PASSES

Amtrak has pared down its figure for providing free or reduced rate transportation for rail employees, retirees, and dependents to 8.6 cents per passenger mile (RA, Nov. 27, p. 13), from 10 cents per passenger mile. Amtrak also said in a brief filed with ICC that it would cost $42.1 million a year to establish administrative procedures for screening such passengers on a space-available basis. Even the new, reduced rate would cost rails $57.8 million a year, complained AAR sources.

TAA TAKES TWO NEW POLICY POSITIONS

Two new national transportation policy positions relating to surface carriers' variable costs and rate bureau action on rate questions have been approved by Transportation Association of America directors. "TAA supports the concept," says the first, "that all surface carrier rates for the transportation of property shall be compensatory; no rate shall be deemed compensatory if it fails to cover the variable costs of performing the service." The rate-bureau position: "TAA supports the principle that rate bureaus should dispose of a rate, rule or charge within 120 days after docketing before the bureau."

WEST AND SOUTH WANT 2% RATE SURCHARGE

Western and Southern rails agreed Nov. 28 to seek an emergency, across-the-board 2% surcharge on freight rates. It was uncertain whether Eastern rails would go along with the surcharge. Such an increase would raise an estimated $150 million in new revenues for Western and Southern rails. AAR Economics and Finance Vice President William F. Betts said even the 2% rate would "fall far short" of rails' increased costs.

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NEWS

NTSB recommends "corrective action" to ICG

The Illinois Central Gulf commuter train accident of Oct. 30 (RA, Nov. 13, p. 11) came in for renewed attention early this month as the National Transportation Safety Board began hearings in Chicago. Just prior to those sessions, NTSB had issued four preliminary safety recommendations to ICG as result of its initial investigation of the rear-end collision between one of ICG's new lightweight bi-level commuter trains and a following train made up of heavier cars acquired when the line was electrified in the 1920s. The accident took 45 lives and injured over 300.

NTSB, while not having fixed finally the role the four specific safety problems "played in causing the collision and contributing to the fatalities," deemed them of sufficient importance to warrant immediate "corrective action." It has called on ICG to take the following steps:

—Install attention-getting marker lights which are effective under all lighting conditions, and to mark the train ends with fluorescent colors that will contrast with typical railroad backgrounds;

—Revise its operating rules to prohibit a train or locomotive which has passed beyond the limits of a block from re-entering that block without protection of a train order;

—Establish procedures to prohibit a train from entering a block already occupied by a passenger train except under protection of a train order;

—Provide a reasonably accurate speedometer for the use of enginemen required to operate trains where rules require limit or control of speed.

NTSB explained that its recommendations for entering or re-entering a block are the result of possible confusion about existing operating procedures. It noted that its special studies of signals and operating rules in 1971 had pointed out vague areas of AAR Rule 99 and this corresponds with ICG's operating code. While the following train did not enter the block ahead of it while it was occupied, it "apparently passed an approach signal. . .and was required to reduce to medium speed (30 mph) at once and to approach the next signal prepared to stop." NTSB added that the second train did not approach the collision point prepared to stop.

"All knowledge of train speed during the accident," continued NTSB, "must be based upon estimates of persons or indirect inference because the older, following train was not equipped with any form of speedometer." To follow operating rules, NTSB added that the engineman of the following train had to estimate his speed "which is an unreliable method of determining speed."

Last week in Chicago, testimony was given by over 30 persons. Included on the witness roster were representatives of ICG management, headed by H. G. Mullins, superintendent-suburban services; along with train crew; passengers; officials of the Federal Railroad Administration and Urban Mass Transportation Administration; United Transportation Union; car design consultants; engineering personnel of St. Louis Car, builder of the new cars; and eyewitnesses of the crash.

NTSB Chairman John H. Reed stated at the opening of the hearing that its purpose was to "determine the cause, or probable cause, to report the facts, conditions and circumstances relating to this accident. . ." And, as he stated earlier: "Appropriate recommendations to help prevent recurrence of such a tragic accident may be made at any time."

FRA expands safety standards

After long consultation and preparation, FRA is accelerating its promulgation of safety standards under the Railroad Safety Act of 1970.

In recent days, there were these actions:

—Federal Railroad Administrator John W. Ingram on Nov. 13 reorganized FRA's Office of Safety, which promises to be a hotbed next year as labor unions mount a drive for stricter enforcement of the Federal Railroad Safety Act of 1970. Named chief of the Compliance Division's Operation Branch was John E. Rourke, who headed up the task force on track and equipment standards. Appointed chief of a new Standards and Procedures Division was Rolf Mowatt-Larssen, former chief of the Engineering and Accident Analysis Division. Associate Administrator Mac E. Rogers remains in charge of over-all safety programs.

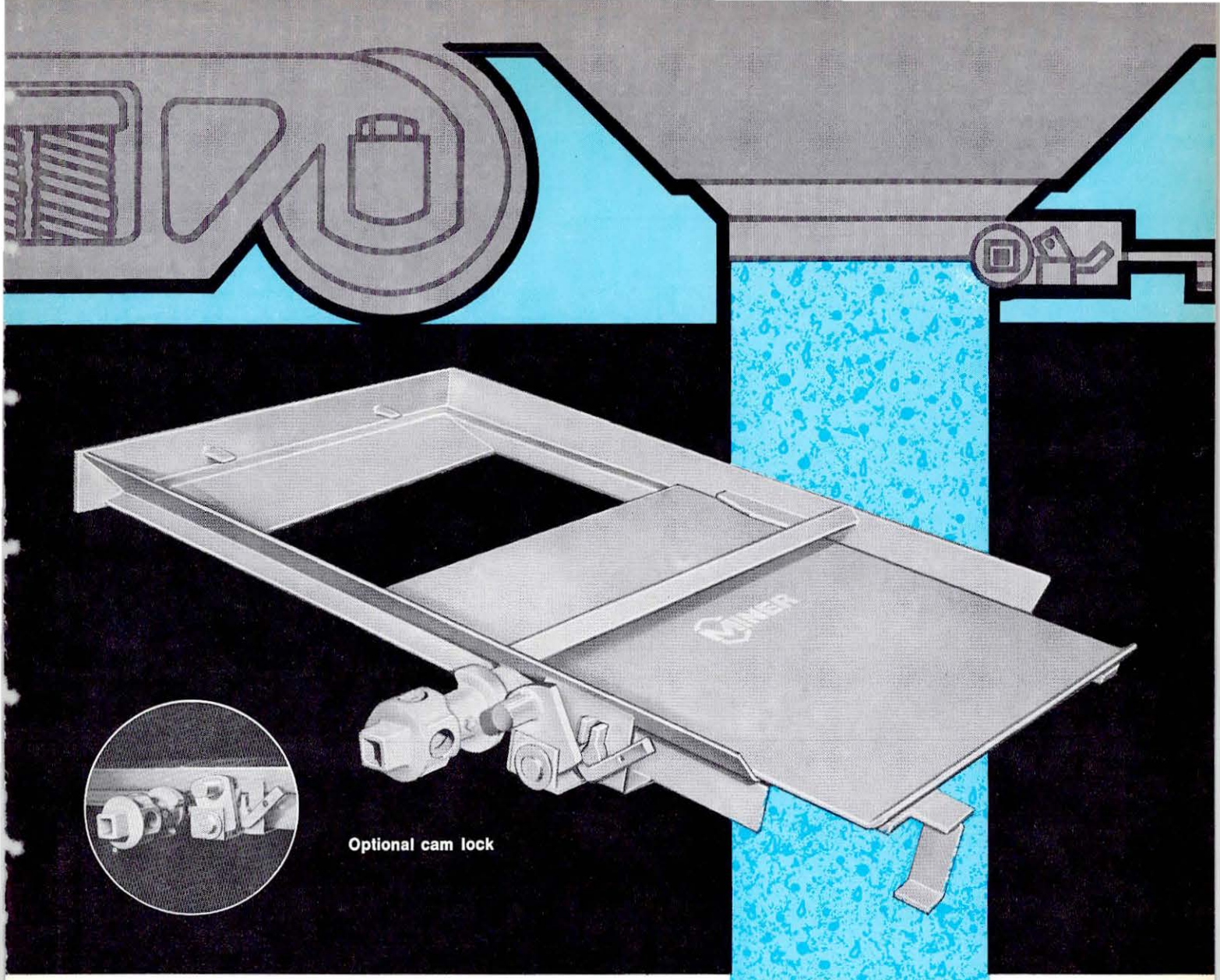
—Ingram indicated that FRA is now working on operating rule standards and on a set of human factors standards.

—FRA granted a 45-day extension for comments on the proposed rule for minimum freight car safety standards, which was published in the Federal Register (thereby obtaining legal status) on Sept. 22 (RA, Oct. 9, p. 20). Written comments now will be received until Jan. 15. Plans were also announced for a Jan. 23 public hearing in Washington on the rule.

—FRA announced a second proposed rule-making on freight car safety governing the lubrication of journal bearings. Published in the Federal Register on Nov. 17, the proposed rule would require repacking of plain bearing boxes every 24 months or, in the case of cars whose plain bearing boxes are equipped with rear seals, box lid seals, and journal stops, every 30 months. Roller bearings must be lubricated every 12 to 36 months, depending on description and size.

—FRA then released yet a third set of rules which prohibit the use of certain freight cars and components. The rules apply to components, a majority of which are already barred by industry rules from cars interchanged between carriers. The new FRA rules, however, are not limited to interchange cars, but govern the operation of any cars having prohibited components and to operation of any cars over 50 years old, even if not in interchange service.

Both the lubrication and prohibited equipment standards parallel closely existing requirements of the AAR Mechanical Division. Ingram explains that they are separated from FRA's previous equipment standards "because of the special problems involved."



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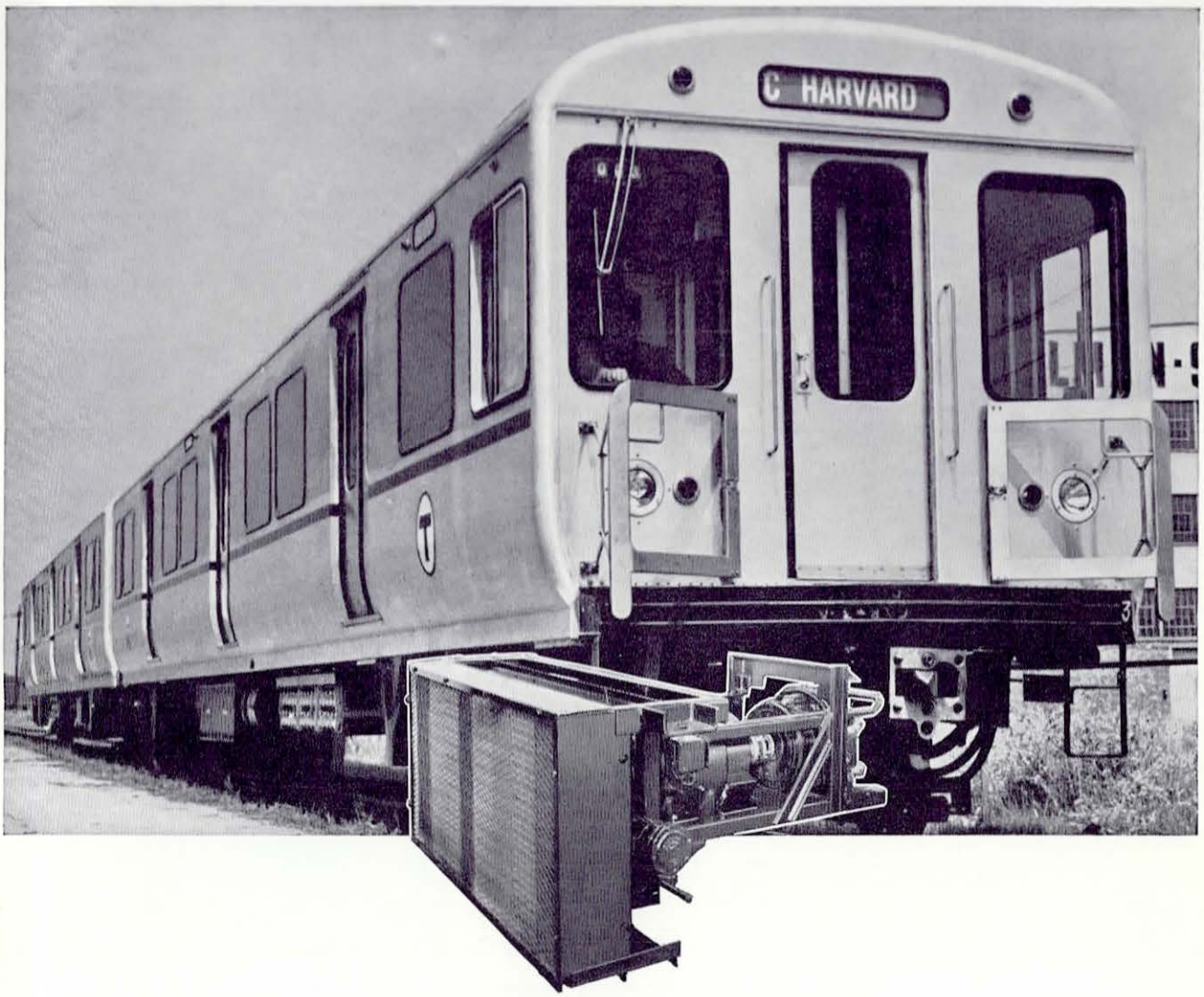

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Watching Washington

REID BEDDOW

SUPERSPEED LINE

Sen. Vance Hartke (D.-Ind.) and Sen. Lowell Weicker (R.Conn.) have joined forces to push a visionary Northeast Corridor rail project out of the future and into the present. Part one of their proposal is for appropriation, beginning next year, of $625 million for rail welding, electrification, curve straightening, and protective fencing of the Boston-to-Washington route. The aim is for average speeds by existing Metroliner/TurboTrain equipment of 150 mph by 1976—just in time for the nation's bicentennial. Part two would construct a $4.5-billion technologically far-advanced "superspeed" line that would result in 400 mph service by 1986—Boston to Washington in 50 minutes.

Amtrak would own and operate the service; the Corps of Engineers would oversee construction; and Penn Central and other bankrupt Eastern rails would stand to gain by sale or lease of right-of-way. Sen. Hartke wants all this to be paid for by elimination of the Highway Trust Fund or a lowering of the tax on highway users and a placing of equal amounts from general revenues into mass transit, including the superspeed project.

The two senators will introduce the bill embodying their plan early next month, along with supporting demographic and other studies.

It is possible that Congress will find irresistible the opportunity to create a "worldwide first"—the senators' words. What is likely is that DOT will introduce a less ambitious plan based on its own Northeast Corridor studies, with a joint bill emerging from committee.

The $5.1-billion price tag placed on the project by Sen. Hartke and Sen. Weicker is one estimate of the cost; that would make it the most expensive civil works project in history.

NEW TACTICS ON TRUCK SIZES AND WEIGHTS

Four years ago truckers suffered a smarting defeat when Congress allowed a bill to increase the size and weight limits of trucks on Interstate highways to die without floor action. The bill was opposed by a formidable combination of the American Automobile Association, major newspapers, and the then-embryonic anti-highway forces. It has long been assumed the motor carriers were lying low, awaiting a propitious time to re-introduce the measure. Now, however, it appears the motor carriers have changed tactics. American Trucking Associations President William A. Bresnahan in a recent public speech advocated that "instead of seeking increases in the Federal limits. . .the effort should be concentrated on repeal of the Federal limits." Such a goal is sure to call into existence an even stronger anti-big truck coalition. Even with the lack of formal opposition by rails and other modes, it is extremely unlikely that such repeal could be effected in the new Congress, whose Senate appears to be even more disposed to push mass transit at the expense of the Highway Trust Fund than the former one. If the motor carriers were disposed to bargain, they could hold out for a *quid pro quo* by which some funds could be diverted from the Highway Trust Fund in return for relaxation of size and weight limits. The diversion battle could be the first major legislative struggle of the new Congress.

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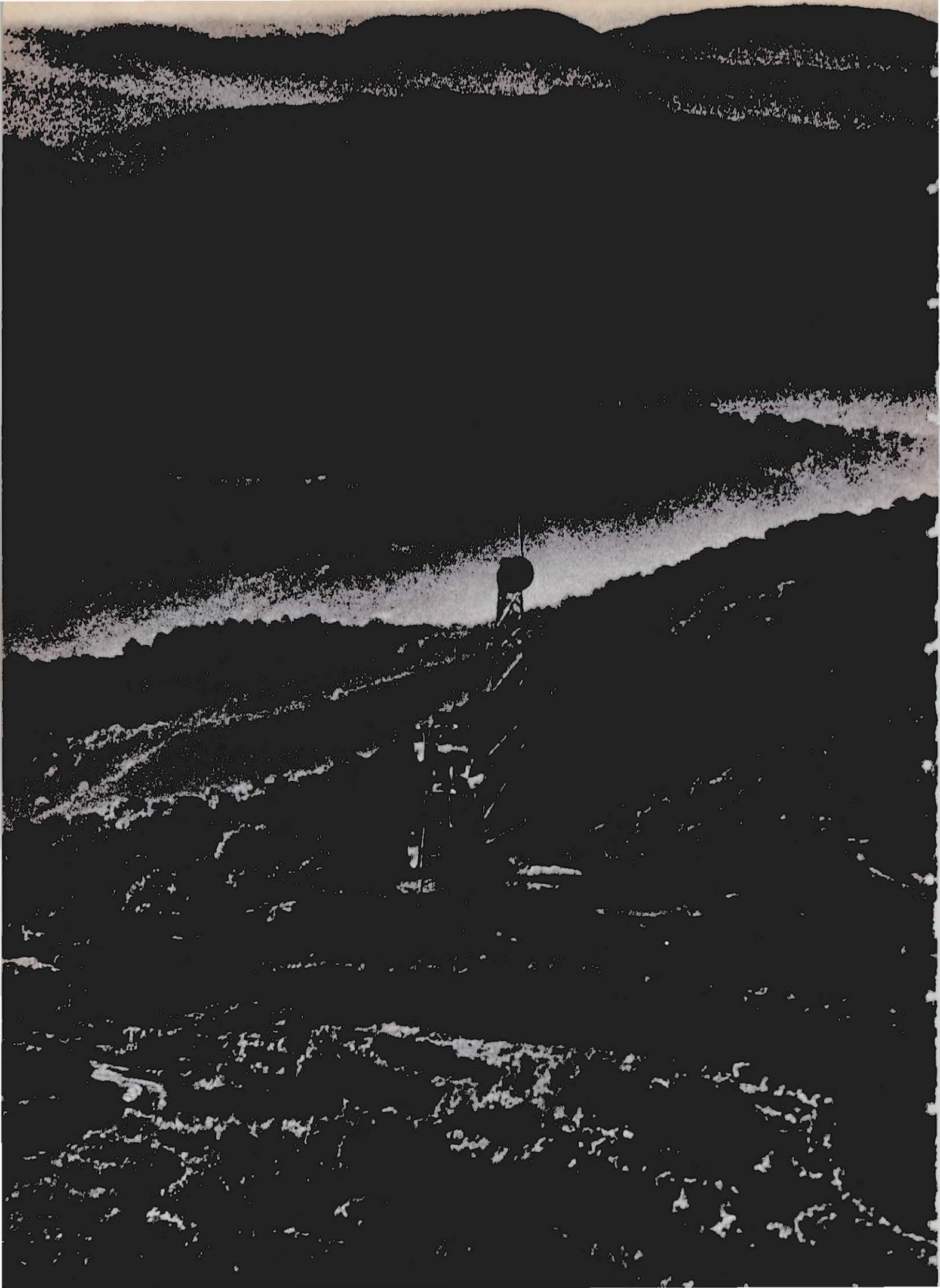

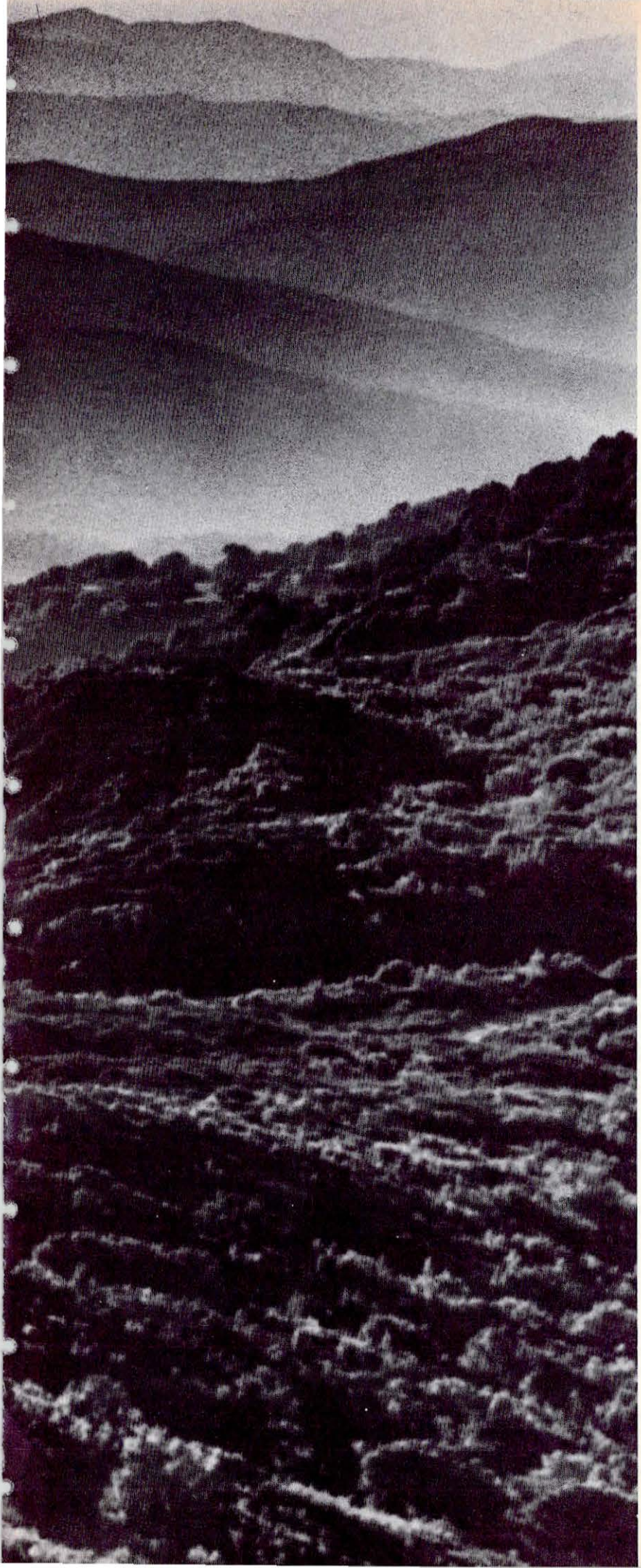

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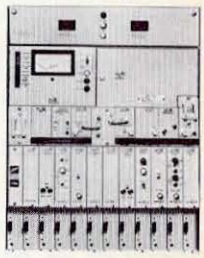

Specifically, the 36A multiplex has been designed for light route service. It's expandable in single channel increments up to 72 channels. And, up to 192 channels using supergroup equipment.

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Circle 8 on coupon page 33

Cherington will succeed Barriger at B&M

John W. Barriger, who was 73 years old Dec. 3 and has spent 55 of those years in or on the fringes of the railroad business, is retiring—again. Trustees Charles Bartlett and Robert Meserve of the Boston & Maine announced Nov. 30 that they had accepted "with regret" the resignation of Barriger as chief executive officer of B&M, effective Dec. 31. He will be replaced by Paul W. Cherington, who is James J. Hill Professor of Transportation at the Harvard Business School and who served as a B&M trustee until his resignation from that position in December 1971.

Eight years ago, at 65, Barriger retired as president of the Pittsburgh & Lake Erie, but he did not retire from railroading. After a two-month stint as a special consultant to the Frisco, he became president and chief executive officer of the Katy. Two years ago he left the Katy to become chief executive officer of the B&M, which had entered reorganization in March 1970.

Last week, B&M Trustee Bartlett said: "We are grateful to John Barriger for his hard work and devotion to the interests of the B&M over the last two years. These are hard times for all the eastern railroads, especially so in New England. John Barriger brought a wealth of railroad experience to this difficult task."

Barriger

Cherington

That experience began in 1917 when Barriger hired on as a shop hand at the Pennsylvania's Altoona shops. He was furloughed to work for a B.S. degree at the Massachusetts Institute of Technology. In 1921, he returned to the PRR's New York division as a rodman. He had become assistant yardmaster at Altoona when he left the PRR, in 1927, to work with Kuhn, Loeb & Co. In 1933, he collaborated with F.H. Prince in preparation of the "Prince Plan of Railroad Consolidation" and that same year he joined the Reconstruction Finance Corporation, serving until 1941 as chief of the RFC's Railroad Division. During the remainder of the 1940's, he participated in the reorganization of the Chicago & Eastern Illinois; represented railroads in wage cases; served for two years as manager of the diesel locomotive division of Fairbanks Morse & Co.; and was reorganization manager and subsequently (until Dec. 31, 1952) president of the Monon. He was a vice president of the New Haven for six months in 1953, and later that year became a vice president of the Rock Island, leaving that position in 1956 to join the P&LE.

Barriger is the author of "Super-Railroads," published by Simmons-Boardman in 1956 and still a basic text for transportation students.

Cherington, whose appointment as B&M's new chief executive officer is effective Jan. 1, will be on leave from Harvard during his new assignment. He will continue to serve as chairman of the board of Temple, Barker & Sloane, Inc., a management and economic counseling firm with headquarters at Wellesley Hills, Mass.

"We need more than new cars"

The Southern System is a consistently heavy purchaser of new rolling stock; in the first quarter of 1973 alone, Southern will take delivery of more than 2,500 new freight cars. But Southern President W. Graham Claytor, Jr., feels it is "too often overlooked that new cars and engines without adequate plant over which to move them will not alone make any significant improvement in railroad service."

Claytor made this observation in an address at the recent annual membership meeting of the National Industrial Traffic League in New York, adding: "There are many circumstances in which expenditures of the same magnitude in plant would improve car supply more than the acquisition of new freight cars."

Claytor recalled that during the 1950's, Southern took up its double track on the line between Cincinnati and Chattanooga and installed CTC. He went on to say:

"Rather than reducing the capacity of the line, this actually resulted in some increase over what its capacity had been as a double track line with single direction running on each track.

"Because of steadily increasing traffic, however, we are now reinstalling the double track on the central district of this line, and this, with CTC and bi-directional operation over both tracks, will give it capacity greater than that of a traditional four-track main line without CTC. This improvement is necessary if we are to maintain our present level of speed and reliability of service over that line. By eliminating otherwise inevitable train delays as traffic continues to grow, this expenditure will provide more capacity in motive power and freight cars than the expenditures of the same funds in new rolling stock."

Claytor said "major expenditures are also being made in new yards, terminals and intermodal facilities so that we can move our equipment and your freight with more of the two characteristics that count the most with shippers—reliability and speed."

Southern's president mentioned various ways in which railroads are trying to improve car utilization, including run-through trains and pre-blocking of cars. He emphasized that shippers can also help to improve utilization.

"One way they can do this is by exercising more care in their choice of routes," said Claytor. "One firm in the Middle West had been ordering about 500 carloads of clay each year, over several different routes. Recently, the company decided to use just one route, involving Southern and one other line. As a result, transit time has been cut from 10-to-12 days to 5-6 days.

"Not only does this lower the firm's inventory requirements, but it also helps the railroads and other shippers by freeing cars for other use. Because transit time is halved, the railroads have the equivalent of an additional 25-to-30 cars available for other movements."

New venture in power development

Southern Pacific Land Company, Phillips Petroleum and Southern California Edison are joining in a search for new electric power sources—sources based in the internal heat of the earth. This geothermal research project will be begun in California's Imperial Valley, on the Salton Sea. The three-way agreement worked out provides for extensive R&D directed toward production of electric power and toward recovery of chemicals and minerals from the highly-heated geothermal fluids. SP Land says this project is a first step in a 10-year agreement between it and Phillips for exploration of geothermal resources.

Takeover threat is real, says Hardin

There are those who say that nationalization of the railroads shouldn't even be talked about—that too much talk could hasten the evil day. ICC Commissioner Dale W. Hardin doesn't agree. He finds that the railroad industry is "heading dangerously in the direction of nationalization" and he suspects that "if railroads are nationalized the other forms of carriage will find it difficult, if not impossible, to compete with the government corporation." To avoid nationalization, he feels that "the great American public must be sharply awakened to the danger to our economy and cost to the individual taxpayer that such a drastic step would entail."

For example, suggested Hardin, the public must be informed that even during a period of great crisis, U.S. railroads are on the whole showing a profit and paying taxes—while nationalized railways elsewhere are operating at great cost to the taxpayers. For example, he said, British Rail in a recent year operated at a cost to taxpayers of $353,760,000; Japanese National Railways, $375,850,000; Italian State Railways, $577,938,000.

Hardin raised the nationalization question in a Nov. 27 address before the 84th annual meeting of the National Association of Regulatory Utility Commissioners at New Orleans.

He emphasized that the question is of interest far beyond the railroad industry itself. "In country after country, where the railroads have been the first to be nationalized, other industries have followed," he said. "If the history of other countries is any gauge, then it would be accurate to say, 'As transportation goes, so goes the nation'."

He noted that "the Department of Transportation is today financing a study by educational institutions of many diverse transportation topics, including 'What is the case for nationalizing all or part of the (transportation) industry?' And the Transportation Association of America in October reported that the current nationalization threat was serious enough for the association to begin in-depth discussions of the subject."

Hardin concluded: "We can weather the threat of nationalization, as was done during the Depression, if constructive steps are promptly taken to help educate the public to the danger. An aroused public, that great silent majority, can, with adequate knowledge and information, preserve our privately owned transportation system. For our transportation system, though often criticized, is, after all, the best transportation system in the world."

Lines on Labor

GUS WELTY

ECONOMICS 101 REVISITED

The railroads, their customers, and their regulators are about to replay one of the basic economics courses—with the carriers going for another rate increase, the customers getting fed up with the whole thing, and the regulators probably wishing that the clock could be turned back to those wonderful years when rate-increase proposals were few and far between. Sitting on the sidelines will be yet another group—the half-million-plus people who draw paychecks from railroads. And they have quite a stake in what goes on—because by the time you consider wages, payroll taxes and fringe benefits, the half-million-plus come out with something better than half of every revenue dollar.

OR, THE EQUATION THAT DOESN'T BALANCE

If you walk around the railroads' economic problems long enough, you find that confusion comes easy—because, given all policies (public and private) as they stand today, there seems to be no direct way out of the bind. And the more things you crank into the equation, the less in-balance it seems. You think about the 42%-over-42-months in the current contracts and the 1973 payoffs yet remaining from those agreements. You wonder what shape Phase III of wage-price control will take. You wonder about how tough labor will hang in '73 wage talks, and about the whole atmosphere in which those talks will be conducted. With payroll costs mounting and average annual employee earnings climbing steadily, you look again at the size of the work force. You suspect that substantial cuts could be made without impairing operations or service, but you wonder how any reductions can really be made in any way except by the slow process of attrition. Sooner or later—and sooner is better—you wish somebody could find the real answer to the old, old problem: how to maintain the dignity of the job—in time of rapid change.

FINALLY, A WORD ABOUT TWO FRIENDS

Speaking of jobs and dignity, two men who have done the former with the latter are stepping down—and the industry is not going to be quite the same. One of these men operated much in the public eye; the other didn't. Each contributed much. And a thought comes to mind about a conversation with one of these men a year or so ago—a conversation that might express the feeling of either or both. After a lengthy interview, this chief executive looked up and said, "I've been doing all the talking. What do *you* think about the future of this industry?" Being stuck for an answer, perhaps nothing new, this reporter's reply was simply that "if I couldn't see a good future, it's time I started job-hunting, and I'm not." The man thought about that for a moment. "I'm not either," he said, "because I feel that way, too, about the future—even admitting that maybe I am a little too old to be looking for another job."

So, two men retire—John W. Barriger and John M. Budd. And it will be a long, long time before anybody with a feel for the industry forgets the contributions each has made, each in his own way. With all its problems, you sometimes wonder why a man stays with railroading. But men do—and as you look back, and look around, you know that this industry has had and has its share of noblemen. J.W.B. and J.M.B. are two.

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RAILWAY EDUCATIONAL BUREAU

Railroads and the environment

Railroads already have a positive story to tell in environmental improvement. Now, they're spending many millions of dollars and man-hours to make a good story even better. The maze of existing regulations makes the task a tough one.

By **GUS WELTY,** Senior Editor

Pollution control—or, to call it by its positive name, environmental protection—is big business.

Over-all, industry will be spending hundreds of millions and perhaps billions of dollars to clean up the environment in all its aspects and to keep it that way. How much money, precisely? Nobody knows—partly because legislators and administrators at all levels have discovered that there is instant popularity to be gained from championing the cause of clean air and clean water. As a result, regulation is piled upon regulation. Local and state and Federal authorities have all gotten into the act—and they have created what might be described as a confusing, frustrating mess for those whose job it is to try to bring an industry into compliance (whatever that may mean at any given location).

For railroads, the problem is particularly vexing—for several reasons:

—More than most industries, railroads are spread out and the larger roads are thus getting the full impact of varying regulations from state to state and even from town to town.

—With the post-World War II conversion from steam to diesel-electric motive power, railroads have already made perhaps the greatest single contribution of any U.S. industry toward cleaning up the air. Efforts directed at eliminating water pollution have been carried forward steadily if less dramatically.

—Studies have clearly indicated that the railroad is a relatively minor polluter, among the modes of transportation and by almost any measure you choose to use. As one expert puts it, "What we're now being forced to do might be compared to gilding the lily."

—Costs are being incurred at a time when finances are in a bind and when other projects are crying out for attention. Serious question can be raised as to whether all of these costs can be justified; but, apparently, justification or no, the bill must be paid.

● **Add it up.** And what does the railroads' bill add up to? In 1970, a survey showed that the industry had spent about $65 million in capital and operating costs between 1968 and '70, with most of the money representing capital investment. Now, a second and far more comprehensive survey has been completed—and the expenditure since '70 has skyrocketed to between $250 million and $300 million. Part of this increase, of course, is due to the fact that in 1970 a number of roads had not really taken a thorough look at the total problem and there were gaps in their own assessing and reporting methods. But the big jump in dollars has been due in part to the increase in regulation and, importantly, to decisions to undertake voluntary action programs.

Future costs are hard to predict. But one thing seems sure: The environmental movement is here to stay—though, hopefully, government may move back from some of the movement's more ludicrous manifestations. In other words, at some point government will have to agree that there is little point in proposing mandatory use of a type of fuel that isn't produced and can't be. At some point government will have to recognize that there is no sense in setting emission standards that the newest locomotives can't meet and in then trying to enforce standards when enforcement would shut down every railroad subject to the requirements. And at some point government will have to realize that you can't limit nighttime noise to decibel levels so low that normal conversation—or a good healthy snore—may actually be noise-polluting at a higher decibel rate. Ludicrous? Certainly. But the record shows that these are in fact examples of what certain states and municipalities have been doing, or trying to do, or seriously thinking about.

● **Railroads act and react.** Meantime, what are railroads doing? Almost without exception, they are setting up specific and wide-ranging inter-departmental groups to initiate environmental projects and to react to problems. Also almost without exception, they are also trying to get across the message that the railroad as a means of transportation is not only a minor factor in pollution but, importantly, a positive factor in environmental improvement.

Railroads have always been concerned with the relationship of their operations to the environment. Until a few years ago, however, they were organized or structured only loosely—and programs and problems were for the most part handled on an ad hoc basis. On most roads, that has changed. On a number of roads, environmental specialists have been added to the payroll to work fulltime on these matters. Environmental-control committees or panels have been formed—with membership that includes the various involved departments and with leadership that insures that environmental concerns will get quick and realistic attention from top management.

One organization that has gotten high marks is Santa Fe's, which is headed by R.E. McMillan, assistant to the vice president-operations. On the headquarters panel are the road's chief engineer, vice president-real estate and ID, assistant chief mechanical officer, special assistant to the VPO, manager-public relations, medical director and an attorney. Working with the Chicago-based group are smaller panels—with engineering and public relations representation—at the field headquarters of Santa Fe's Eastern, Western and Coast Lines.

Norfolk & Western is another road which has recognized the internal/external aspects of environmental control and, in fact, NW has set up its fulltime ecology section within its Department of Public Affairs. The section itself is headed by a director-environmental protection and NW has also now created a staff assistant vice presidency in the department with the aim of establishing closer communications with all regulatory agencies and "promoting long-range plans to preserve, protect and improve the environment in the areas of our operations." (NW, it should be noted, held a systemwide Cleanup Day last July 1 and, with thousands of

Dr. William J. Harris, Jr.
AAR Vice President—Research

James R. Coxey
Manager-Environmental Studies

How railroads are tackling the problem in Washington

There is new life in the AAR's Research and Test Department these days—partly in research, partly in test and partly in that broad area known as environmental control.

When Dr. William J. Harris, Jr., joined AAR (from Battelle Memorial Institute) several years ago as vice president in charge of the department, he found not much going on in the environmental sense. He changed that. He began spending a lot of his own time on environmental matters, and he set up an Environmental Studies Division in the department with James R. Coxey as manager.

At about the same time, President Nixon set up the National Industrial Pollution Control Council in the Commerce Department. A Sub-Council on Railroads and Railroad Equipment was later appointed. Southern Pacific President B.F. Biaggini was named chairman of the sub-council—and AAR was asked to work with the group in assembling information and drafting reports. This it has done—with a 1970 survey and another which was completed only a few weeks ago. Hopefully, Dr. Harris says, annual surveys can now be taken—to update the information file and to blueprint the industry's progress in dealing with environmental matters.

Under Bill Harris and Jim Coxey, however, AAR's involvement has been far more than merely one of collecting data. Among other things, AAR has worked on the locomotive-emissions problem. It has worked on the human-waste-disposal problem. It contracted with Battelle for a survey on the various transportation modes and the environmental concerns involved. It has contracted with SP for study of locomotive-smoke measuring devices.

The studies have been valuable. Battelle, for example, found that the railroad is by far the least-polluting mode of surface transportation. And SP's work on smoke meters promises to bear fruit soon—with agreement on a device which (unlike the mis-used Ringelmann Scale) can be used to accurately measure locomotive smoke opacity.

Harris and Coxey, in all of this, are realists. Says Coxey: "There can be no contest with the desirability of improving our environment, whether we're considering air, water or noise. But we should be realizing that in the total picture, railroads are very low polluters in all three areas." And says Dr. Harris: "This is not a question of our being totally discriminated against. But it is a question of balance. And on balance, a national environmental-improvement program would make much more progress if traffic increases would go to railroads—which are the least polluting—than if they were to go elsewhere and, really, than if railroads are to be forced to make the environmental investments now required."

employees participating, set about picking up what added up to thousands of tons of debris. For this effort, NW got the property in spic-and-span shape. It also won the top Keep America Beautiful Business Award for 1972.)

Burlington Northern is yet another example of wide-ranging involvement. At BN, over-all responsibility rests with M.M. Donahue, AVP-operations, with environmental-control staff people working directly under B.G. Anderson, AVP-engineering. Most recently, BN has gone the committee route—to bring in safety and rules, law, mechanical, transportation, public relations and community relations. Coincident with this, BN has been setting up environmental committees in each of its six regions—and this, BN says, is a move which will provide "both involvement and responsibility on a grass-roots level, something which we did not similarly enjoy prior to merger."

● **Different—but the same.** On other roads, specifics vary—but top-level responsibility is almost universal. At both Illinois Central Gulf and Milwaukee Road, for example, it is the vice president-chief engineer. At Chessie System, the system works through an engineer-environmental control who reports to the vice president-operations and maintenance. At Seaboard Coast Line, an environmental engineering section is part of the mechanical department, while at Louisville & Nashville, there is an environmental group with an assistant to the VPO at the top. At Frisco, Vice President-Operation J.H. Brown is the senior responsible officer. Rio Grande splits its environmental-protection efforts between the chief mechanical officer and the chief engineer, each with a system staff. Bangor & Aroostook puts responsibility in the hands of its manager-operations and maintenance, with a committee made up of top people in transportation, mechanical, engineering and purchases and stores. At Missouri Pacific, the man is John G. German, AVP-engineering. Southern has a committee chaired by the manager-research and tests; Southern Pacific uses an inter-departmental group headed by General Attorney Harney Wilson, and Penn Central operates through a similar committee under Frank L. Manganaro, manager-environmental control.

What do these officers and these committees do? For one thing, they worry a lot. For another, they spend a lot of money—and they worry while they're spending it, because nobody really knows in some instances whether Solution A to Problem A will later be defined by some law or regulatory

One major worry: Today's solution can become tomorrow's problem

agency as actually being Problem B, to which a new and expensive Solution B must be found.

● **Worry: About what?** In any consideration of environmental problems, it is hard to find a handle—or to know which handle to grab first. Do you worry about diesel smoke and other emissions. . .or weed and brush control. . .or crosstie disposal. . .or the scrapping of freight cars. . .or fuel spills. . .or water treatment. . .or sparks from locomotives and from brake shoes. . .or noise from yard operations and shop operations. . .or diesel horns at grade crossings?

Essentially, based on the comments from a dozen-and-a-half roads to Railway Age, you worry about trying to be a responsible citizen in the communities you serve—and you worry, fret and struggle with restrictions that may or may not be more fad that anything else. One case in point: The toilet-training of America's railroads. The catch-phrase was catchy: In disposing of human waste from trains, "the only law the railroads obey is the law of gravity." And it is true that the method of disposal has been discharge onto the right-of-way. It may also be true, as one railroad environmental expert notes, that "There is no reason to believe that anyone ever got sick or was even inconvenienced by this method of handling." Still, the Food and Drug Administration has now ordered that there shall be no discharge unless the material is "suitably treated." As yet, there has been no definition of what "suitably treated" means. But, railroads (and suppliers) have undertaken research which has resulted in development of equipment producing cleaned-up effluent to standards "far more stringent than the regulations of the FDA. . .This is one more example of the extent to which the railroads have gone in meeting the ecological desires of society even before society has spelled out exactly what it wants."

Or, take another problem, the disposal of wood crossties. In an average year, there are roughly 25 million old ties pulled out of track. They can't all be sold for fence posts or firewood. But burning is out of the question in many areas, tie shredders have to cope with bits of metal which may be imbedded in the wood, and trucking of ties to sanitary landfills is both expensive and not everywhere practicable. As one operating officer puts it, "We have not been great fans of the concrete tie. But if we get in a bind on supply of wood ties and then have an economic problem developing in disposing of wood ties, the economics may change."

How about weed and brush control? Burning is frowned upon, so you turn to chemical treatment—which is also subject to regulation. And there is another problem: Burning did not destroy the roots of the vegetation, and in fills and cuts the remaining roots had a stabilizing effect. Now, sighs one engineer, "You not only have the added costs of chemicals, you also have added M/W costs in stabilizing embankments."

Then, there is the question of wayside fires—whether caused by locomotive or brake-shoe sparking. Railroads have been spending tens of thousands of dollars annually on fuel additives designed to reduce carbon buildup and to lubricate the combustion chamber. They have also gone through several generations of spark-arresting equipment, each generation with a higher price tag. As one road notes, in the beginning there was a simple fire-screen arrestor that cost about $100 per unit. Then came a more effective swirl-type arrestor at a cost of about $300 each. Now, regulations in at least one state in which this road operates will require installation of carbon-retention spark arrestors at a cost of almost $1,000 each. Another road, also operating in western territory, has gone 100% to purchase of road units with dynamic brakes—a move which it regards as making "a major contribution to elimination of wayside fires, particularly in mountain-grade areas." The added cost, over the past three years, has been close to $3 million. As for the sparking problems with brake shoes, there are wide variations in practice. Some roads are switching to composition shoes, others aren't even testing them. One that is making the switch is BN, which specifies composition shoes on all new freight cars and is converting about 2,000 cars a year in the existing fleet. BN is also standardizing on use of high-phosphorous cast-iron shoes on locomotives and cars designed to use cast-iron.

● **Cool, clear water.** Without much doubt, however, the biggest single area of problems and expense is in prevention of water pollution—and nobody is quite sure what may lie ahead in view of Congressional passage of the Clean Water Act of 1972 over the President's veto. Chemistry professors and such keep telling their students that oil and water don't mix—and environmental regulators are making sure that oil and water DON'T MIX. In some areas, this has been a problem for more than a decade—California, for instance. But the railroads have, thus far, been able to meet the challenge—and they are probably farther ahead on water-pollution control than on any other single aspect of environmental control. Santa Fe is one example: In 1961, it developed a water-treatment facility—in California—which may have been the first such facility in the country to successfully handle the detergent problem. Since then, water-treatment and oil-separation facilities have been put in all across the system—and, in effect, Santa Fe is running its own recycling operation: Old tank cars are used in the oil/water separation process, and what is separated out can be burned in power plants.

And all of this doesn't even consider another problem—the fact that in urban and rural areas alike, there are people who regard a railroad right-of-way as a convenient and trouble-free dumping ground for the old mattress, the old refrigerator, the junk car or any other junk that's too big for the garbage can and would be too expensive for the collector to haul away.

● **Who does what to the world.** In the face of all this, do railroads have anybody in their corner? They sure do. Maybe not Ralph Nader, the man who did it to the Corvair, but certainly Dr. Barry Commoner. Dr. Commoner may be the No. 1 man anywhere in ecological and environmental studies. In his book "The Closing Circle," he takes note of past achievements of railroads—the change from steam to diesel—and he also points out what railroads have been pointing out: Increases in truck traffic, to the detriment of rail traffic, are also causing increases in pollution. Dr. Commoner cites energy figures—an average of 624 btu per ton-mile for railroads as against an average 3,460 btu for motor carriers. He cites energy/production requirements for highway construction as opposed to railroad construction. He cites land-use, railroad vs highway. In each instance, the railroad comes out as the lesser of polluters.

So what is to be done? On one side, apparently, are responsible people like Dr. Commoner. On the other are those who might be regarded, as they were in one railroad man's comment, as "misguided zealots" and "hippies, young and old" and "politicians who were quick to realize that at no time in our lives has there been such an opportunity to endorse a movement with so little risk of contest." And somewhere in the middle is a presumably-responsible government—and a lot of presumably-responsible corporate officers and directors who (1) want to do what ought to be done, and at the same time (2) want not to break their companies by being forced to do things to satisfy people who would be home only at

"Environmental control is here to stay; it is not a fad"

Henry David Thoreau's Walden Pond.

One thing railroads can do—and are doing—is to put the transportation function to work in the interest of the environmental movement. And then to talk about it.

Talk about what? For openers, talk about the railroad role in moving low-sulphur coal to utilities in markets that never had it before. For something else, talk about the Chicago sludge trains (pioneered by ICG) which get the gunk out of the metropolitan area and into the farmlands where it can do some good as fertilizer. Talk about railroads moving junk cars out of the cities to recycling/disposal plants. Talk about railroad plans to move cities' solid waste—garbage—to landfill sites.

● **Then there's TOFC/COFC.** Piggyback is another positive point. Every trailer moved by rail is a trailer not moved over-the-highway—and the figures are pretty clear on rail-vs-truck air pollution. As Penn Central puts it, "by shifting this traffic from the highways to the railroad, we're improving the quality of the environment—and reducing the pressure for additional highway construction."

The public, however, may not be ready to recognize the environmental difference between moving three million trailers and containers in highway service and moving them in rail service—which is what railroads did in 1971, and that was a "down" year for TOFC/COFC. What the public should be ready to recognize is what railroads are doing to help electric utilities clean up the air—and to help those same utilities prevent the blackouts or brownouts that would result if railroads were not bringing in the low-sulphur coal now required.

This particular operation may really go to the crux of the matter. On the one hand, there is the fellow who says "Why should I worry about air pollution? I'm used to it." On the other hand, there is the activist who says "It's dirty. Shut it down." Somewhere, there is the citizen who sees his lights dim, who listens to his air-conditioner tail off, who sees his television picture narrow and maybe die. He is not about to picket his local Con Edison. He is going to demand the service he has been used to—and he is the guy who is going to appreciate, finally, the railroad role in giving him that service at the same time he is getting less-choking air.

And what are railroads doing? Plenty. Millions of tons worth of revenue-producing effort toward reducing air pollution. Union Pacific, Burlington Northern, Rio Grande, NW, L&N, Milwaukee Road, Southern, Missouri Pacific, Santa Fe, and others are either doing it as originating carriers or they are thinking about it. And there are others, acting either as originators or as connecting lines.

And while all this is happening on the one hand, what is happening on another? Well, not long ago the Interstate Commerce Commission turned down a rail rate increase on so-called recyclable commodities. And an outfit called SCRAP (for Students Challenging Regulatory Agency Practices) has filed suit in Federal court challenging increases granted by the ICC last October. SCRAP, it might be noted, has been described as a "law student ecology group." Or, as one railroad environmental officer asks, plaintively, "Why is it always the railroad that has to subsidize goodness and virtue?"

So, what is needed among railroads—given the "environmental movement"? Action, first. And then, a promotion of the railroad—as it is and as it is going to be.

And neither promotion is actually difficult. Because the railroad story is, in fact, positive.

Look, for a moment, at the kind of environmental research railroads are doing—and at the railroad which may be the most research-minded in the industry, Southern Pacific. On its own and in cooperation with others in the industry, SP in the past couple of years has undertaken at least eight specific projects in air-pollution control. It has water-treatment installations under construction or planned at five points. Like many another road, it has changed procedures on human-waste disposal and on disposal of solid waste—old freight cars, crossties, scrap. And it is rapidly moving ahead with noise studies, in yards and in train operation.

But it doesn't end there, and SP furnishes yet another example of the railroad improving the environment through the transportation function. For one thing, SP has developed an experimental freight car for use in disposal of the thousands of junk cars that litter both urban streets and rural areas: "By enabling scrap dealers to increase the size of their loads and making the cars easier to load and unload," SP says, "we hope that some incentive for the salvaging of auto hulks can be provided. Up to this time, economic factors have not been conducive to this sort of thing."

There is more: SP has also designed a model "ecology train" to attack the abandoned-car problem. This would be a train that would include a car with a crusher and tire grinder, disposal cars for the crushed hulks and gondolas to carry the scrap rubber. Material developed by SP has now been turned over to General Motors.

SP's attitude is typical—in the industry as a whole but in the West especially. BN's statement of corporate purpose, for instance, talks of the profit aim and an intention to discharge corporate responsibilities "in a conscientious and superior manner. . .to employees, customers, stockholders, suppliers and society." At Santa Fe, the top environmental officer puts it a bit less formally: "We're not running scared and we don't want to be in a position of running scared. We're citizens of a lot of communities—and we want to be good citizens. We want to do the things that ought to be done before we're told that they have to be done."

● **Telling the story.** Railroads generally, it might be noted, have been coming off rather well in terms of public recognition of efforts in behalf of environmental improvement. Individually and through the AAR, they are trying to make sure that (1) the record stays clean, and (2) is recognized as such. As the environmental officer for a major eastern railroad notes, "All top management personnel, including the president, are aware that environmental control is here to stay, that it is not a fad or a passing fancy, and that our company is dedicated to being a good corporate citizen in this regard. When an em-

ID men have their

A railroad has one set of environmental problems as a railroad. It has a whole other set as a landholder and land developer.

Industrial development efforts, for example, have to take environmental concerns into account more than ever before. So do urban-area development efforts. In ID, it is no longer enough to tell a community how many new jobs a new plant will generate. Increasingly, or so it would seem, communities are looking at environmental impact first and jobs second—and, in fact, more than a few major existing plants, some of them in one-industry towns, have been environmentalized out of business. As for urban-area development efforts, you

ergency does arise, therefore, the necessary authority is generally available to insure its proper handing with minimum embarrassment and maximum advantage to the company."

To the end that problems—and opportunities—get prompt attention, virtually every major road has some kind of distant-early-warning system, formal or informal, through which environmental-control people and top management are kept on top of developing situations. Not all roads have a formal organization. But, as Western Pacific puts it, for example, "All of our line and staff departments and officers are aware of the company's responsibility in this area."

But, it is not always easy. Take, for instance, the matter of locomotive emissions. The locomotive builders have done a thorough and continuing R&D job on emission control. Major railroads (especially in the West, where Santa Fe, SP and UP have done a lot of work individually and cooperatively) have added to the knowledge fund. But progress comes slowly. Only a small percentage of the locomotive fleet is new in any given year. Retrofitting of older units is time-consuming and expensive. Some of the oldest units, still with operational and economic value, simply can't be cleaned up to meet the most restrictive standards. Then, there is even the question of how to measure emissions—and the commonly-used scale, it is said, simply doesn't do the job. And, there is the problem of trade-offs—because as matters now stand technologically, if you reduce smoke emission you can wind up with an increase in nitrogen-compound emissions.

● **A positive move, but...** There are also problems at the other end of the scale, in pointing up the positive contributions of the industry to general environmental improvement through such devices as the unit coal train, TOFC/COFC, and movement of urban commuters by rail. Rock Island, for one, got some sample of this kind of problem when it tried to get into the sludge-train business: "Despite many tests and prior uses which proved that the sludge is non-polluting and has great value as a soil conditioner, local opposition at the destination point halted this specific operation." Now, destinations have been changed and RI is still in the business—but as an originating carrier with just a switching haul, not as a line-haul carrier. There is an added irony: despite its financial problems, RI has been actively pursuing its own environmental-improvement programs on both the compliance and the initiative side.

Perhaps one thing that is needed is a greater spreading of information on specifically what railroads—and other forms of transportation—do to the environment. More people might be made aware, for example, that:

—Per ton-mile of service performed, a truck must exert about four times as much energy as a locomotive. Emissions, a recent study shows, follow about that same ratio. So does fuel consumption per unit of work performed.

—Today, there is about a linear mile of highway for every square mile of available land, and highways (especially around urban areas) have a way of becoming jammed as soon as they are opened. Railroads, in contrast, could handle far more traffic on existing plant without new requirements for land.

—Safety may not always be recognized as an "environmental" concern, but the fact remains that another recent study shows that a relatively small increase in the railroad marketshare (at the expense of the increases in highway transport) could result in impressive savings in terms of highway deaths and injuries.

● **Head start—and hard work.** Or, as the AAR puts it, "With all the environmental advantages railroads possess, they are not unaware that criticism has come their way." And, though many of the problems "are obviously minor, in the larger environmental picture, railroads take them seriously. They will continue to work on solutions... railroads— which began with a head start, because of their very nature—don't intend to fall behind now." ■

own set of environmental problems

have to look no farther than to Chicago's lakefront—where Illinois Central Industries has major in-town development plans and where activist groups are buzzing around ICI like angry bees.

Then, there are the roads that qualify as the really big landholders—those roads, mostly in the West, with millions of acres, and with environmentalists keeping a watchful eye on what happens on those acres.

What is happening is, for the most part, indicative of the fact that railroads are not only low-profile polluters as railroads but also responsible citizens as landholders. For example, there is BN—with about 2,385,000 acres owned in fee in 11 states and one Canadian province and ownership of mineral rights on more than six million acres. BN can point to several ways in which it is demonstrating concern for the environment—in reclamation of coal lands, in enlightened forest-management practices, in bringing barren lands into production. And one of the more dramatic demonstrations is taking place at Colstrip, Mont., where BN predecessor Northern Pacific mined coal for its steam locomotives for more than 30 years. Little more than a year ago, Colstrip was a pretty barren place. A photo of the 1,000 acres of spoil banks might have justified the caption "Rape of the Landscape." BN had no legal obligation to do anything about it. But, obligation or no, BN set to work. In the past year, about 285 acres have been contoured, fertilized and planted. Last spring, more than 2,300 trees were planted in the reclaimed area. Eventually, there will even be a small lake made available for recreational purposes.

All contracts written by BN with companies mining BN-owned coal require that all state and Federal laws on reclamation be observed. Says Chairman Louis W. Menk: "We will insist that use of our Montana lands by others reflect the same degree of concern for the state as do the railroad's own operations."

That's BN—but the approach is typical.

PHILADELPHIA, HERE WE GO: Sweat out the traffic jams on the Benjamin Franklin bridge or zip by on a PATCO train.

What does Lindenwold prove?

By **JOE ASHER**, Transit Editor

It's not too easy to feel sorry for Robert Johnston, general manager of the Delaware River Port Authority's PATCO (Lindenwold) line. Granted, he has his troubles. For example, he says, "I'm hurting badly for new cars," and he says it with deep feeling. But often as not, Johnston's problems are the problems of success, not failure.

In the rush of publicity over the opening of BART on the West Coast, it has been easy for the news media to lose sight of the extent of PATCO's success back in the East.

PATCO after all is much smaller than BART—it's just 14.5 miles long, has 12 stations and 75 cars, serving the south New Jersey suburbs of Philadelphia.

But the idea that BART is the first brand new transit line to come along in this country in 60 years is wrong. PATCO has been in operation almost four years. It is highly automated, it has had no operating or labor troubles worth mentioning, it is financially strong and it is popular with its riders. In short, it is as good a showcase as any for demonstrating what modern rapid transit can do.

● **42,000 riders a day.** Take Johnston's complaint about needing cars. It stems from the best of all troubles—success in attracting the riding public. When the PATCO line opened in February 1969, the daily weekday average was about 15,000 riders. The average has climbed steadily to the point where it is now better than 42,000 daily, or close to triple the original figure.

"Here-and-now technology is perfectly good when the system is well designed"

—Robert Johnston
General Manager, PATCO

According to Johnston, two six-car trains were scratched in the design stages of PATCO, in the interest of economy.

Now those two trains and more are badly needed. PATCO put in an application last month to UMTA for $35,672,000 in capital grants (two thirds Federal, the rest local money). Of that sum, $11,256,000 is to go for one batch of 28 cars, $8,040,000 for a second batch of 20 cars.

The remaining $10,815,000 is for construction of a new station at Woodcrest, between the existing stations at Haddonfield and Ashland, with an important highway interchange close by.

Says Johnston, "Without the new cars and station, I can see our traffic stabilizing in the 47,000- to 50,000-rider bracket. With the additional cars and station, traffic can continue to grow and could reach the upper fifties."

● **Feeder buses.** An important element in all this is that Transport of New Jersey, a bus system with routes paralleling those of PATCO, finally concluded an agreement to start feeder services to the PATCO stations.

Logically the agreement should have come long ago, but without it, PATCO was limited in the catchment area it could reach. Parking spaces at PATCO stations were doubled from 4,500 to 9,000; they are still mostly filled on weekdays.

Now the bus feeder situation looks better. According to Johnston, "We finally convinced TNJ that getting more seats covered several times for short distances was much better than getting far fewer seats covered maybe one time for longer distances."

The feeder service is just a month old

MOTORISTS DO SWITCH TO TRANSIT: This parking lot is at Ferry Ave. station.

and it would be rash to draw conclusions from early figures. But there is no harm in mentioning an immediate 8% jump in weekday ridership on PATCO, and about a 20% jump on weekends.

(And get this: The gain in off-peak business caused an increase in the consist of certain off-peak trains from two cars to three cars.)

So declining ridership is one trouble PATCO does *not* have. Another one it doesn't have is operating deficits. True, in 1970, the first full year of operation, there was an operating deficit of $147,000. Last year it was shaved to $6,700.

This year, there has been a net operating *profit* of $536,000 through Nov. 3. And Johnston figures it will come to about $600,000 for the full year.

He attributes this to several factors:

—A high degree of automation. This has several aspects, of which the biggest is one-man operation of the trains, be they two-car, three-car or (at peak periods) six-car trains. A change in the car consist does not entail adding or subtracting men.

Another aspect is efficiency in the entire fare collection process, not just installing automatic collection equipment. At 6.5% of gross revenues, Johnston has the lowest cost of collection in the industry, and he includes in that figure maintenance of equipment, maintenance of closed-circuit TV for scanning the stations and the cost of the odd refund.

Then there is the leanness of the operation. There are just 243 people on the PATCO personnel roster, and that includes everybody, top to bottom. Johnston calls them well-motivated, and high in morale.

● **Salaries and wages.** The net result is that salaries and wages come to just 44% of gross revenues. (Compare that with some big-city systems where salaries and wages come to *more* than gross revenues.)

With all this going for him, Johnston is riding pretty high. It is true that the parent Delaware River Port Authority absorbed the $92.5-million construction cost of PATCO, and that PATCO so far has been exempted from interest and depreciation expenses on those costs. But it was understood from the beginning that the real point of PATCO was to take some pressure of automobile and bus traffic off the DRPA bridges into Philadelphia and hopefully break even on operations. And this it has certainly done.

● **The land-use benefits.** What no one has done so far is to quantify the land-use benefits PATCO has brought to its area. Besides obvious things like a drop in air pollution and in traffic jams on the bridges, there is also the real estate development that came in the Camden-Lindenwold corridor as a result of the PATCO line. Preliminary surveys show new shopping centers, a rise in population, and a sharp rise in the price of homes. Failing exact comparisons with other corridors fanning out from Camden, it can only be said on an eye basis that the Lindenwold corridor where PATCO runs seems to show the fastest and biggest growth.

Johnston will not be drawn into critiques of his fellow transit system operators for not showing results like his. On the subject of super-light-weight cars in recent accidents on BART, and the Illinois Central Gulf lines, he says, "They could have been much worse."

But of course he is proud of the stainless steel PATCO cars which have a 99% on-time record (as chief engineer he oversaw their design) and thinks no others around are better. "It's true the BART car has a more rakish nose than ours does, but it also makes it somewhat clumsy to alter the makeup of the train."

● **The automation factor.** Comparing automation on his system with that of BART, he says, "We decided in the design stages that we were going to give the operator certain functions to do—in effect, make the operator part of the automation." Involved is Wabco wayside and General Electric train-borne equipment.

On the BART system, the train operator (called attendant) presses a button to start the train and the only other operating he does is manual override of the control system in emergencies. The PATCO system is mostly the same, but the train operator controls dwelling time in stations, and takes a hand in consist control and turning of the train at the end of the trip.

These are small points in the degree of automation, perhaps, but in Johnston's view, "We made those decisions consciously, to keep the operator alert, and useful when you really need him."

What does all this add up to? PATCO is a real-life system that is already here and that works the way it is supposed to.

PATCO proved that:

—People will leave their automobiles to ride trains. The jammed parking lots at outlying stations attest to that.

—PATCO proved that the best of present-day technology can meet the competition of other modes and other disciplines—PATCO is a railroad, not a rocket, a chopper or a tracked air cushion vehicle.

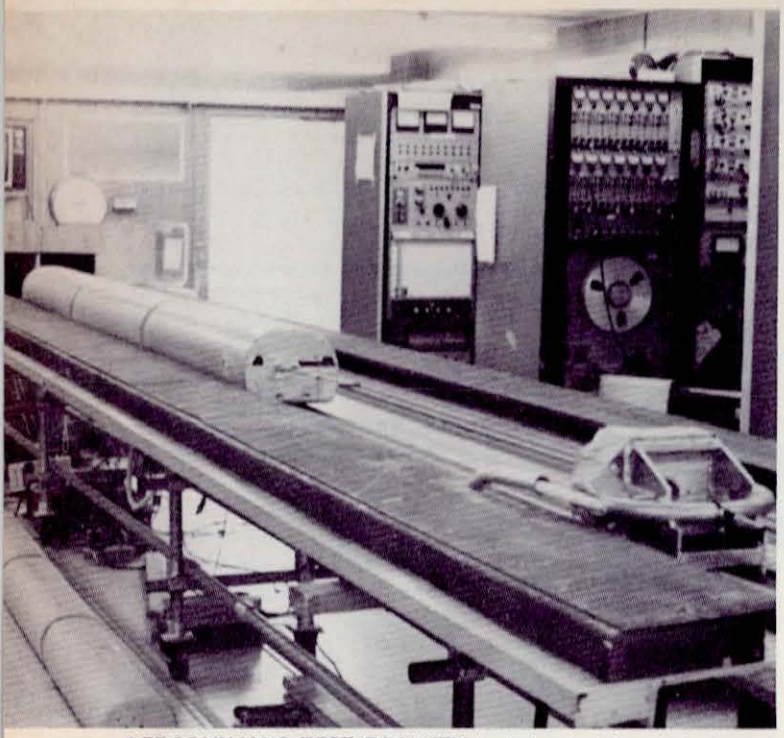
—PATCO proved that automation can get operating costs down to the point where they are manageable.

—PATCO proved that modern rail transit can be good looking. Years before the BART system opened, the handsome cars and functional stations on the PATCO lines drew favorable comment, and a loyal following.

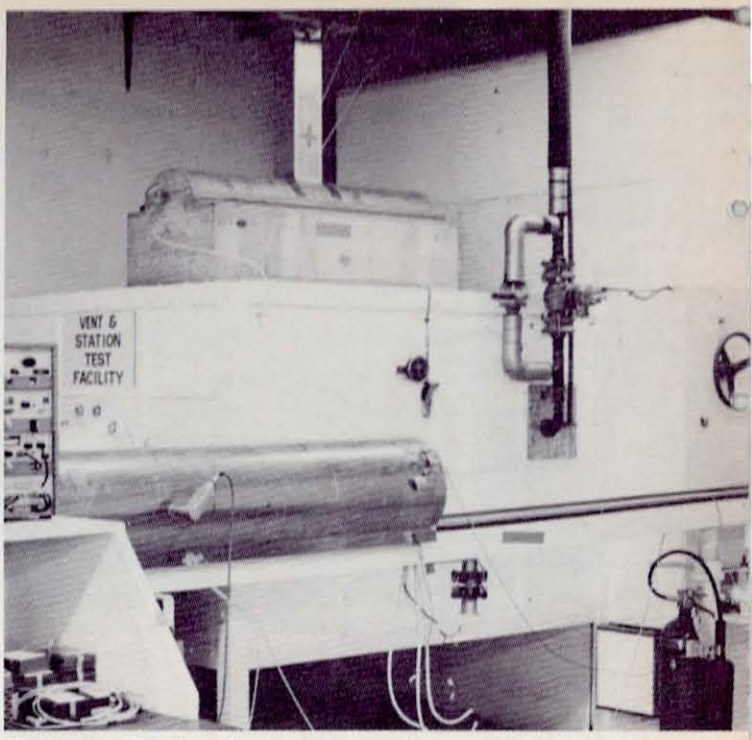
In sum, PATCO proved that there is such a thing as transit without tears—no handwringing, no red ink from operations, no disgruntled customers, and no new burden for local politicians to bear.

Johnston says he feels "frustrated" by the amount of studying instead of building that goes on in the transit industry. He holds no special brief for sexy new technologies, and believes strongly that what is here and now is perfectly good when it is well designed.

But it takes a man like Johnston to make it all mesh and then follow it through. Maybe Johnston is a one-man sexy technology all by himself. ■



AERODYNAMIC TEST FACILITY includes double-and single-track tunnel models; data from such experiments produces computer simulation program that can appraise alternatives.



STATION MODEL and tunnel vent simulation yield data on more complex air flow produced at major discontinuities in subway tunnel system. Test set-ups are being preserved.

IRT manual: Making subways better

While it will never make any "best seller" lists in Sunday papers, the Environmental Control Handbook for Underground Rapid Transit Systems, to be published in 1973, seems destined to become a major reference source for subway designers throughout the world. Publication will mark completion of a project conducted by the Institute for Rapid Transit with substantial funding from the Urban Mass Transportation Administration.

IRT has marshalled much of the expertise of the transit industry (and some outside it) in a $3-million research program which culminates in the preparation of the industry's first reference book spelling out precisely what makes a good subway system. The technical experts involved include representatives of IRT, of operating transit properties, transportation consultants, and specialists in areas of thermodynamics, aerodynamics and models.

● **An improved environment.** Goal of the IRT project is to assure that heat and humidity need not be synonymous with summer subway riding, at least in transit tunnels constructed from now on. Already this is being achieved in systems under construction. The environmental control costs of Bay Area Rapid Transit have exceeded those of any other system built to this time. Washington's Metro has allocated about $85 million for tunnel ventilation and station air conditioning. Montreal's Metro, faced with excessive tunnel temperatures, was forced to install expensive ventilation equipment after its subway was in operation. All these represent fixed-property installations and are separate from any attempt at environmental control through air conditioning of cars.

Actually, the heat discharged by car air conditioning in tunnels serves to raise the temperature there and complicates the subway environment. There are other complicating factors. Between 85% and 90% of all the heat in a subway is generated by the trains. About half is the result of braking, the remainder representing that developed by acceleration, traction and air conditioning. With the high performance now required of subway trains, the net effect is to release even more heat in tunnels.

● **The heat sink.** With no forced ventilation from fans or similar equipment, the train-generated heat only can go out through ventilating shafts when air is displaced by the piston effect of train movements through the tunnels, or it can go into the surrounding rock and soil—an absorption process into what is known in electronics as a "heat sink." Measurements have shown that this subway heat sink will stabilize about 5 degrees F. higher than the annual mean temperature of the city—50 degrees for Toronto and 60 degrees for New York, for instance.

All physical components of the subway and all characteristics of the environment have to be considered in calculation of tunnel temperature, air pressure, ventilation rate and similar factors. Involved is not only the comfort of passengers at stations, but also the satisfactory operation of mechanical and electrical equipment which can be affected adversely by temperature extremes, humidity and the presence of electrostatically charged dust particles.

R.M. Coultas, IRT executive vice president, describes the organization for this Project on Ventilation and Environmental Control in Subway Rapid Transit Systems as follows: W.J. Reinhardt, IRT's director of development, is project administrator. There is an advisory board consisting of representatives of every rapid transit system in the U.S.,

Canada and Mexico. John O. Hoban, of Port Authority Trans-Hudson, is chairman of the advisory board. Bernard Adler, New York City Transit Authority, and Marshall Greenspon, Washington Metropolitan Area Transit Authority, are the co-chairmen. UMTA's Rail Project Branch, through Jeffrey Mora, monitors DOT's project expenditures.

● **The research effort.** In 1970, IRT awarded a $3-million contract to a research team headed by Parsons, Brinckerhoff, Quade & Douglas to study the subway environmental problem. Emphasis was to be given to thermal environment, including air temperature, air flows and humidity, but air quality and air pressure changes were also to be considered. In addition to PBQ&D, the research team included DeLeuw Cather & Co., Henry J. Kaiser Co., the California Institute of Technology and its Jet Propulsion Laboratories, and the Aerospace Technology Division of Developmental Sciences, Inc.

The three consulting firms—Parsons, Brinckerhoff; DeLeuw Cather; and Kaiser—established the methods for analytical evaluation and then for establishing criteria for vehicles, stations and tunnels. CalTech/JPL developed theoretical models for the aerodynamics and thermodynamics of trains operating in tubes. Aerospace Technology constructed geometrically true scale models (one-sixteenth size) of subway tunnels, trains and stations. These models have been tested and the results extrapolated to full-size systems through the use of scaling laws developed by CalTech/JPL.

The consulting firms will produce a series of charts and tables which will give a rapid preliminary calculation of the thermodynamics and aerodynamics of a tunnel under study. There will also be an extensive computer program which can give a much more precise analysis, allowing detailed alternative environmental designs to be weighed.

The Handbook will include criteria for temperature, humidity, air velocity and rapid pressure changes in a subway station and train under normal and emergency conditions. It is intended to establish the basic factors that affect a patron's thermal comfort—but this will not be a uniform standard for the Western Hemisphere.

To enable subway designers to translate thermal comfort into working values, Kaiser Engineers developed a totally new standard—Relative Warmth Index which takes into account the patron's activity level and clothing, in addition to temperature, humidity and air velocity. This gives a means of assessing the impact of a short stay on a station platform in a high performance subway which may involve no more than 90 seconds. Already this RWI has been applied to the design of several subways—including that proposed for Baltimore.

Data to be included in the Handbook has already been utilized by WAMATA in the design of ventilating shafts. By revising its under-platform cooling procedures and equipment, an estimated $2 million has been saved. In the design of a new access to New York's Kennedy Airport, the Port Authority was able to evaluate over seventy tunnel configurations—an evaluation that would have been economically impractical without IRT's computer program.

● **Ongoing program.** The model test facilities constructed for the Handbook program will remain available for outside use after the current project is completed. Like wind tunnels for aircraft and hydraulic model basins for ships, the tunnel models will enable subway designers to obtain quantitative data on specific system design factors that might not otherwise be capable of analysis.

Sometime during 1973 the 4½-pound Handbook will be ready for distribution by IRT. It is expected that not only designers and operators of transit tunnels will find the book useful, but also urban planners who will be increasingly involved in city-center access that does not involve the automobile. As a PBQ&D spokesman recently noted, the ultimate beneficiaries will be those who never read the Handbook—or even knew that it existed. These are tomorrow's subway riders. ■

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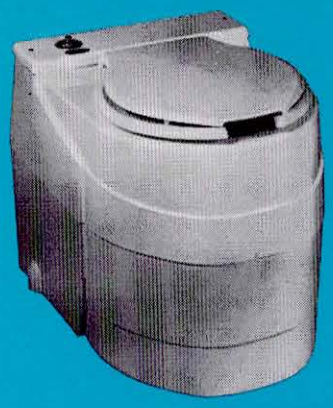

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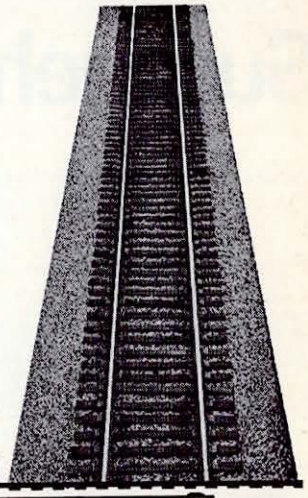

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AFTER JULY FLOODS washed out Penn Central's huge Shocks Mill bridge, PC built this temporary causeway to expedite rebuilding.

Susquehanna hits PC hard–twice

NOVEMBER FLOODS washed out temporary causeway. Destruction of causeway, used to get machinery and materials to work area in center of river, forced a delay of about three weeks in rebuilding.

By **MERWIN H. DICK,** Engineering Editor

Judging by its conduct this year, the Susquehanna River, in addition to being destructive, is treacherous and determined—as engineers of the Penn Central are only too aware. If they weren't before, they surely got this total awareness as they were struggling to get back into service a key bridge across the Susquehanna in electrified territory that had been severely damaged by the "Agnes" floods in June.

Look back: On July 2, about one-third of the Shocks Mill double-track, 2,200-foot, multiple-span, stone-arch bridge collapsed into the Susquehanna, the result of relentless pounding by record flood waters generated by Tropical Storm Agnes. In November, a contractor's force was driving to complete a nine-span, deck-girder bridge on concrete piers, which was being built to close the gap in the 66-year-old masonry structure.

● **River plays trump card.** The schedule was to get one track into service over the bridge for diesel operation early in December. Allowing for the usual contingencies that affect projects, the work was more or less on schedule. Meanwhile, the river was quietly biding its time. It had allowed the contractor's forces to build a causeway far into the river, from which reconstruction operations were being carried on. Then the Susquehanna played its trump card. Record rains again sent the river on a rampage in November, washing out the causeway, and setting the schedule back about three weeks.

Two of the three weeks were lost just waiting for the water to recede sufficiently to allow the causeway to be

rebuilt. This time, the causeway was made higher than before, and more bridge spans and large-diameter pipes were included. The aim is to keep the causeway intact until the substructure is completed. Barring further flareups in the river, the schedule now is to put a track into service for electrified operation on January 9 and the second track into operation the following day.

The setback in November was just another episode in a story comprised of suspense, shrewd planning and dramatic action. Some of the elements include finely-tuned managerial decision-making, bold engineering action in meeting and overcoming difficult problems and, finally, a reconstruction job in which the contractor's forces are under severe pressure to complete the project by the set date. Always in the background is the fact that the main character in the story—Penn Central—is bankrupt and, hence, under the supervision of a reorganization court.

Built in 1904, the Shocks Mill bridge, about 25 miles south of Harrisburg, Pa., consisted of 28 stone-arch spans averaging 80 feet in length. The electrified line carried by the bridge connects the PC's network of main and branch lines east of the river with strategic Enola Yard on the west side and about 24 miles north of the bridge. At the time it was knocked out of service in July, the bridge was carrying an average of 50 freight trains daily.

● **A $4.5-million project.** With a considerable portion of the Shocks Mill bridge lying on the river bottom, PC management and its engineering department were confronted with a difficult situation. The problem, it must be remembered, had to be considered against a backdrop of wide-spread destruction of bridges, tracks and equipment on other parts of the system due to the "Agnes" floods. Thus, the railroad was faced with a heavy drain on its resources, and naturally had to move cautiously, but with haste, in coming to a decision regarding the Shocks Mill bridge. Reconstruction of this one bridge would cost an estimated $4.5 million.

One thing was certain: Pending restoration of the Shocks Mill bridge, or an alternate route, provision had to be made to handle the huge volume of traffic that normally moves across the long arch structure. To accomplish this, extensive track changes were made on an emergency basis in the Enola-Harrisburg area to take care of the traffic. This arrangement, in itself, was an incentive for fast action because of the cost: "We figure," said a PC spokesman, "that the emergency arrangement is costing the railroad $1 million per month in additional operating expenses."

For a time, the possibility was considered of replacing the Shocks Mill structure with an alternate crossing of the Susquehanna some distance upstream. Another factor was the possibility of Congressional action on proposed legislation that would make low-cost, long-term loans available to railroads in the stricken area for reconstruction purposes. PC's management was holding onto hope that the legislation would become law, thereby taking some of the pressure off the increased financial bind brought about by the "Agnes" flood damage.

● **Domino effect.** But this state of apparent suspense did not keep the road's engineering department from going into action looking to possible reconstruction of the Shocks Mill bridge. It wanted to be in a position to move—and move fast—if the decision was in favor of rebuilding. An appraisal of the damage showed that it was foundation scour causing settlement and tilt of Pier 14 that caused collapse of a portion of the structure. Pier 14 is one of three so-called anchor piers in the bridge. These piers, of heavier construction than the others, were incorporated in the structure at intervals of seven spans to absorb the thrust from the adjacent arches during the construction period.

When settlement and tilt occurred at Pier 14, the result was to disturb the restraining force against thrust of the adjacent spans. This produced a domino effect in causing collapse of these spans, explains W.J. Sponseller, assistant chief engineer-construction. The portion of the structure that

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Circle 12 on coupon page 33

TWO NEW PIERS are shown under construction. Man in view is D.V. Anthony, project engineer.

collapsed included four spans east of Pier 14 and two spans west of that point.

Engineering forces of Penn Central, under the direction of C.T. Popma, chief engineering officer, were faced with important decisions regarding reconstruction of the Shocks Mill bridge, providing management decided to rebuild the structure. To help in making these decisions the road engaged the services of Tibbet, Abbet, McCarthy & Stratton, consulting engineers in New York. A representative of this firm was on the site of the bridge at 11 a.m. on the day the collapse occurred, indicating the urgency with which the road viewed the need to proceed with haste in planning reconstruction.

Even before the flood waters had entirely receded in the wide, relatively shallow river at this point, drilling crews, with their rigs lashed to the piers, were making borings in the river bottom above and below the existing piers. The engineers were thus provided with a preliminary geological profile of the river bottom. These borings indicated that some deterioration had apparently taken place in the foundation conditions since the bridge was built.

● **What type of construction?** While the borings were under way, PC's bridge engineering forces were making preliminary studies of the procedure to be followed if the decision were made to reconstruct the bridge. These studies quickly ruled out the use of arch construction on the basis that it would be too costly and time-consuming. It was the time factor that also ruled out through-truss construction in favor of deck-girder spans.

Assuming the use of steel spans in reconstruction, it was decided, in the interest of permanence and safety, that it would be necessary to remove the remaining arch spans back to anchor Piers 7 and 21. These piers, of heavier construction than the intermediate piers, would be converted into abutments for the steel spans.

In adapting Piers 7 and 21 for their new function, they were strengthened to withstand the thrust imposed by the adjacent arch spans. This was done by installing post-tensioned cables down through each pier and into bedrock. These were placed at such an angle as to counter the thrust from adjacent spans. The anchors consist of nests of cables placed in steel sleeves installed in bored holes and grouted in position. Following installation of the cables and their anchoring in the rock, they were post-tensioned by jacking.

A contract for post-tensioning Piers 7 and 21 was awarded to Spencer, White & Prentice, foundation specialists. This work was started on July 7, before a decision had been made to rebuild the bridge.

● **Detail plans on hand.** As for the superstructure that would be constructed if the decision were made to rebuild the bridge, the road fortunately had on hand detailed plans for a deck-girder structure that could be adapted to the Shock Mill location. The plans, made in 1964 and providing for all-welded construction, were for a bridge that was built across Chester Creek at Chester, Pa. The span length for this structure was somewhat longer than the 122 feet adopted for the Shocks Mill bridge, but the plans could easily be adapted.

PC's engineering department was thus in position to move rapidly when the road received authority from the reorganization court on August 29 to restore the Shocks Mill bridge by spanning the gap in the arch structure with the 122-foot girders carried on concrete piers and with the end spans landed on original Piers 7 and 21 as post-tensioned and otherwise adapted to serve as abutments. A petition seeking the authorization had been filed with the court August 16.

● **Race against winter.** PC engineers thus had before them the task of constructing, in the shortest possible time, a nine-span, double-track, deck-girder bridge supported on eight new concrete piers having an average height of 60 feet. The fact that winter was approaching dictated the need for completing the piers by late November to avoid placing concrete in winter weather when winds on the river would produce a substantial chill factor. There was also the possibility that a sudden thaw, resulting in a rise in the river level, might delay the substructure work.

Because of these and other considerations the schedule was established that called for one track to be placed in service for diesel operation across the bridge on December 1. Electrified operation over both tracks was scheduled to start by the end of the year.

A contract for the substructure work was awarded to Spearin, Preston & Burroughs. Bethlehem Steel Corp. won the contract for fabricating and erecting the steel spans. Sponseller has direct supervision over the project and D.W. Anthony is project engineer.

● **Causeway is built.** The decision was made to carry on the substructure work from a causeway built into the river from the west bank. The causeway would be built partly from borrow and partly from rubble produced in cutting back the existing arch structure to Pier 7 on the east and to Pier 21 on the west.

The portions of the old structure were demolished by blasting. To establish the cut-off points in Piers 7 and 21 for the bridge seats, a line of vertical holes was drilled transversely to the track in each of those piers, causing the masonry to be sheared off at that location during the blasting. Each of the piers was then modified to provide a concrete seat for the girder spans and to enlarge the pier in the longitudinal direction.

Construction of the causeway was started August 10 from the west shore, with the objective of extending it all the way across the river to Pier 7, giving a length of about 2,100 ft. The causeway provided a working area for men and equipment and was wide enough to extend underneath the structure so that excavation for most of the pier footings could be carried on from dry land. Excavation for all but two of the pier footings was done in this manner. The exceptions are the third and fourth new piers from the east end. Excavation and construction of these piers was carried on inside steel sheetpile cofferdams. The cofferdam at each of these piers was sealed with tremie concrete.

● **More borings made.** As soon as the locations of the new piers had been established, additional borings were made at each location. These were used, in conjunction with the borings made earlier, in designing the pier footings.

The contractor was working his forces two 10-hour shifts daily six days a week, and, if he could get the men, he was working certain operations seven days a week, Sponseller said.

As a guide in measuring the weekly progress of the substructure work, a bar graph indicating the scheduled progress on the various elements of the job was prepared. On Tuesday morning of each week a no-holds-barred meeting was held with the contractor, says Sponseller. Purpose of the meeting was to check on the progress being made. If progress had fallen behind that indicated by the bar graph, the reasons were analyzed and arrangements made to bring the work up to schedule the following week. Obviously, major revisions had to be made in this schedule when the causeway was washed out in November. ■

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Circle 15 on coupon page 33

New Products Report

Mobile service station can be worked by only one man

A mobile service station has been developed by Fruehauf Corp.'s Fruehauf Division. It is engineered to provide full service facilities for diesel locomotives, in-plant truck terminals, off-road construction operations, or for any other areas where it is not practical to move equipment to permanent service facilities.

Using an external ring tank trailer as the basic unit, the service station has three tank compartments separated by double bulkheads. The front compartment holds 3,500 gallons of diesel oil; the middle compartment, 500 gallons of water (or glycol anti-freeze during winter months); the rear compartment, 500 gallons of engine oil. Each tank section has a volume gauge so the operator can easily check product levels. To facilitate liquid flow, a gravity/air pressure system is used for product discharge. This procedure practically eliminates maintenance, keeps costly downtime to a minimum and allows almost any tractor to act as the power source. Air pressure from the tractor compressor pressurizes each tank compartment individually, giving excellent product discharge even during cold winter months.

The first five such units, Fruehauf says, were recently placed in service by a large common carrier at five relay stations throughout the country. The carrier claims that with the new units a tractor can be serviced in 12 to 15 minutes, depending on the type of service required. Instead of a two-man crew normally used for tractor servicing and refueling, only one man is needed with the mobile service station.

Circle 60 on reader service card

"Tracer" can find metallic and non-metallic pipe and conduit

A lightweight self-contained instrument for locating metallic pipe and cable has been introduced by Aqua-Tronics, Inc. The instrument, called "Tracer," features impedance matching in the direct output mode for conductive tracing, variable power control on the transmitter, separate battery enclosures away from other instrument components, and a handle on the receiver for easy one-hand operation. "Tracer" is waterproofed for all-weather operation.

A complementary accessory is a small solid-state transmitter especially designed for probing non-metallic conduit or pipes of 2½-inch inside diameter, or larger. The transmitter emits signals while probing inside underground or conduit pipe which are monitored above ground with the "Tracer's" receiver. The operator is able to determine both position and depth of the unit. Complete mapping of non-metallic ducts also can be made. Transmitter operation is guaranteed to a depth of 50 feet.

Circle 61 on reader service card

Reflective sheeting offers high visibility from any angle

MAClite reflective sheeting for screen printing and for marking rolling stock to attract attention at night has been announced by Morgan Adhesives. It features an aggressive adhesive which can be applied to painted and even slightly coarse surfaces at temperatures as low as 40 deg F. An easy-releaser liner simplifies removal at time of application and minimizes the chance of stretching. Standard colors are silver, yellow, orange, red, green and blue with multi-colored emblems produced by screen printing on silver with transparent inks. When properly applied, exterior durability of three to five years

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can be expected, with the sheeting exhibiting good resistance to cleaning solvents and other solutions. The wide-angle, highly reflective enclosed lens offers high visibility when viewed from any angle or when completely soaked by rain.

Circle 62 on reader service card

Tone generator has 2-tone synthesizer

Motorola's S-1333A digital tone generator incorporates a two tone sequential synthesizer. These solid-state/integrated-circuit units offer independent variable tone duration and independent variable inter-tone delay making them a fast and accurate means of testing two-way radio selective signaling tone systems.

Two groups of four thumbwheel switches allow the operator to set up one or two tones of four digits each. Duration and delay of the tones is programmable for two-tone sequencing. Light emitting diodes are used as indicators to show the actual tone duration and intervals as they occur. These instruments provide audio signals over the frequency range of 10 Hz to 10 KHz.

Circle 63 on reader service card

Plastic switch targets are economical and long-lived

An innovation in reflectorized switch targets is being marketed by McCAR Co. The newly developed targets use ABS plastic and PVC pipe, instead of aluminum. The plastic banners are flexible, maintain their original shape and are virtually unbreakable. They will not swell, shatter or warp, which results in longer life and smaller replacement costs. The targets have pre-formed masts custom-fitted to the switch tips, which eliminates the need to bolt the mast to the switch tip. It also prevents vibration and wobble. The price is lower and the freight cost less than for aluminum because of the lighter weight of the plastic. There is no need to bolt the mast, so savings accrue from the initial investment, lower installation costs and the longevity of the targets.

Circle 64 on reader service card

NEW LITERATURE

RAPID TRANSIT MAINTENANCE. Whiting Corp.'s "Trouble Shooter's Guide," GT-108, shows Whiting rapid transit repair and inspection systems at work and tells how they can help solve maintenance problems. Equipment for car and train moving, exterior washing, car retarding and holding, and overhead crane systems are illustrated and explained in the 8-page bulletin.

Circle 70 on reader service card

OUTDOOR LIGHTING. General Electric's Lighting Systems Business Department has published a 72-page catalog entitled "Outdoor Lighting Systems—Designer's and Buyer's Guide." The catalog combines GE's many roadway and area lighting luminaires into a complete source book for outdoor lighting systems using high intensity discharge lamps: mercury, metal halide or Lucalox.

Circle 71 on reader service card

ELASTOMERIC TRUCK PADS. A newly revised, 2-page bulletin from Lord Kinematics describes the elastomeric LC—PADS for railroad trucks. The bulletin contains a cost saving chart showing maintenance costs on a standard truck compared with a truck equipped with LC-PADS.

Circle 72 on reader service card

EFFLUENT ANALYSIS. Bulletin PCS-6 tells how railroads can have the latest analytical equipment at their disposal with Contract Analytical Services for effluents from Nalco Chemical Co. Equipment in the Nalco laboratories in effect constitutes a pool of instrumentation available to railroads in controlling and reducing pollution without high capital investment in analytical equipment and excessive analyst payroll costs.

Circle 73 on reader service card

PORTABLE ELECTRIC JACKS. A newly revised edition of Whiting Corp.'s Portable Electric Jacks bulletin, GT-106, illustrates how Whiting jacks are built to lift at the lowest cost. Also illustrated in the 6-page bulletin is the company's Rapid Truck Change-Out System.

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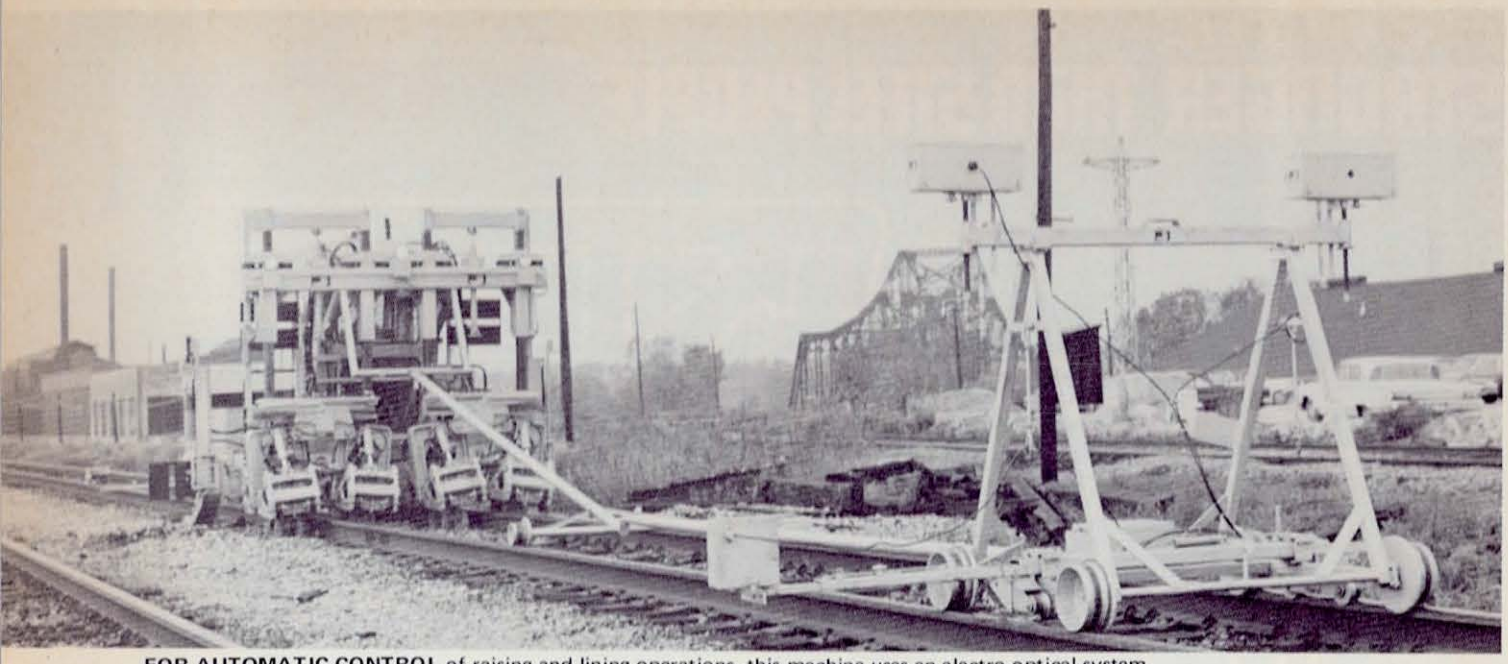


FOR AUTOMATIC CONTROL of raising and lining operations, this machine uses an electro-optical system.

New tamper does many jobs

Manufacturers of tie-tamping machines continue to maintain a high rate of activity in bringing out improved models. The latest offering is the Model 2600, the TampTrak, from the Jackson Railroad Equipment Co.

In operation on a large midwestern road recently, this machine was surfacing, lining and tamping the track out-of-face while making a lift of 1 inch. A representative of the manufacturer said the machine can also be used for spotting work and for tamping switches, in which case, he added, it will tamp the entire turnout. He said the manufacturer's objective in bringing out the machine was to produce a unit that would be assigned to a roadmaster for performing any kind of surfacing, tamping and lining work.

One special feature of the Model 2600 are the tamping tools which are mounted on two workheads, eight tools to each head. These tools, of the vibratory-squeeze type, are also designed to tilt toward the base of rail under hydraulic pressure during the tamping operation. The eight tools comprising each workhead are mounted in pairs. Each pair has a motor for imparting vibration to the ballast at high frequency.

For automatic control of jacking, cross-leveling and lining, Model 2600 uses the same electro-optical system as on other recent models of the company's tampers. This system uses light sources on a front buggy, slotted metal masks at the point of jacking and lining, and light sensors on a rear buggy. Shoulder jacks are used and forces imparted to the track when lining are transmitted through the jacking feet.

• **Simplified design.** Simplification in operation and maintenance was emphasized in the design of the machine. The electronic system incorporates only seven solid-state printed circuits in the form of modules; four extra modules will protect all circuits. Similarly, the hydraulic system incorporates a minimum of components. All hydraulics are enclosed in a hinged-cover cabinet on top of the cab.

When performing out-of-face surfacing and lining work, the machine is first used to "set up" the track by raising, cross-leveling and lining at chosen intervals and then dropping back and tamping out of face. On the midwestern road, the track was being jack-tamped at intervals of eight ties, but any convenient interval could be used, depending on weight of the rail and other factors.

When the track has been "set up" for several rail lengths, or for any desired distance, the machine is brought back to the beginning of the stretch and then used to tamp all ties in the track that has been raised.

In this type of operation, using single-insertion tamping, the production rate of the machine has ranged up to 1,800 feet per hour. Over a three-week period the machine consistently averaged more than 3,000 feet per day of track raised, lined and tamped in about 5 hours of on-track time.

Model 2600 is available without jacks for use as a tamper in a tandem job.

• **Operation on curves.** When working a curve, the machine is first run around the curve so that the mid-ordinates can be read from a scale in front of the operator. The ordinates are plotted on graph paper and a corrected curve is drawn. The corrected ordinate for the body of the curve, along with the super-elevation, are cranked into the machine. As the unit moves around the curve the super-elevation is jacked into the track automatically, but alignment is brought to the corrected ordinate by manual control using push buttons. On the spirals, corrections are made by manual control from markings made on the ties.

When the 2600 is used for spotting track, the amount of "crowning" desired at the joints can be dialed into the machine and it will be jacked into the track automatically.

Switch tamping. To convert the 2600 for switch tamping, each pair of tamping tools can be replaced by a single tool by removing four bolts. Jacking feet are also available that can be fastened to the jack rod with the foot in a position perpendicular to the track so it can be placed on the ballast between the long switch ties. In addition, the work heads have a traversing feature so that the tools can be pinpointed for tamping in narrow places.

During its demonstration on the midwestern road, the 2600 was used to tamp four turnouts—two No. 8s and two No. 6½s. On the average, these switches were tamped at the rate of one per hour. ■

Market Outlook

CARLOADINGS

Loadings of revenue freight in the week ended Nov. 25 totaled 459,183 cars, according to the Association of American Railroads. This was a decrease of 73,139 cars, or 13.7%, compared with the previous week, and an increase of 50,817 cars, or 12.4%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended Nov. 25 are estimated at 13.9 billion, an increase of 10.9% above the corresponding week of 1971.

REVENUE FREIGHT CARLOADINGS

Commodity	Nov. 25 week	Nov. 18 week
Grain	25,888	29,038
Farm products	18,245	19,151
Metallic ores	34,241	36,314
Coal	76,296	91,816
Crushed stone, gravel & sand	20,542	25,786
Nonmetallic minerals	8,585	9,673
Grain mill products	17,331	19,228
Food and kindred products	22,343	24,907
Primary forest products	20,073	24,297
Lumber & wood products (except furniture)	14,101	17,931
Pulp, paper & allied products	20,975	23,175
Chemicals & allied products	22,362	25,368
Petroleum products	8,204	9,501
Stone, clay & glass products	16,871	20,194
Coke	6,733	8,224
Metals & products	22,209	24,343
Motor vehicles & equipment	23,782	27,782
Waste & scrap materials	13,265	16,049
Forwarder & shipper assn. traffic	5,809	7,212
All other carloads	61,002	72,057
LCL traffic	326	464
Total cars loaded	**459,183**	**532,510**
Cumulative total, 47 weeks	1972	1971
	23,646,319	**23,019,345**
Estimated revenue ton-miles (billions) 47 weeks	709.8	671.4

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week ended Nov. 18 totaled 28,357 cars (13.2% above the corresponding week last year) and 49,434 trailers or containers (up 20.1% from 1971). Cumulative volume for the first 46 weeks of 1972 is 1,176,733 cars (up 10.3% from last year) and 1,988,784 trailers or containers (up 13.6% from 1971).

IN CANADA

7 days ending	Tons of Revenue Freight	Cumulative Totals
Nov. 14, 1972	4,717,266	183,590,934
Nov. 14, 1971	4,188,526	185,732,637

CAPITAL EXPENDITURES

● *Burlington Northern.*—Announced detailed plans to spend $135 million in 1973 for new rolling stock and other capital improvements. BN and its subsidiaries—Colorado & Southern and Fort Worth & Denver—will acquire 66 road locomotives, 15 switch engines and 1,390 freight cars, including 650 previously announced box cars (RA, Oct. 30, p. 67), 400 open hopper cars, 35 covered hoppers, 105 gondola cars and 200 bulkhead flat cars. In addition, BN shops will rebuild or modify 550 box cars, 400 covered hoppers, 400 open hoppers and 300 bulkhead flat cars at an approximate cost of $8 million.

FREIGHT-TRAIN CARS

● *Freight-car orders and deliveries.*—The following report has been received from the ARCI and the AAR:

DELIVERED

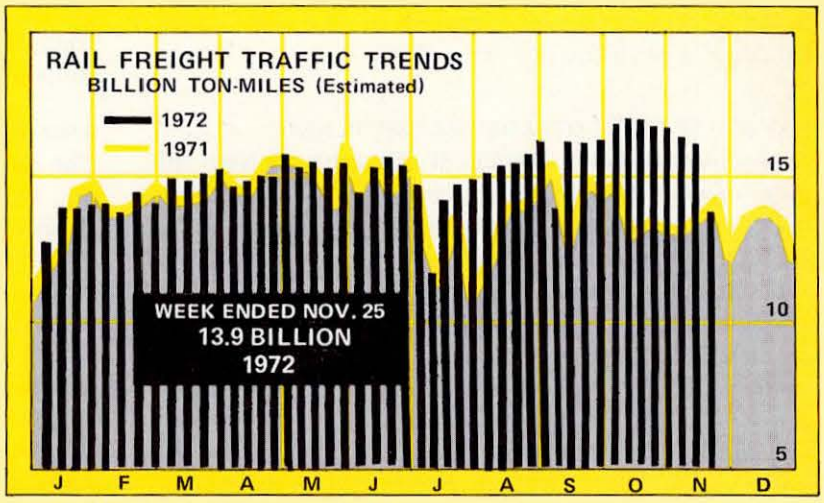
	Oct. 1972	Sept. 1972	Oct. 1971
Built new by carbuilders	3,487	2,619	5,076
Built new in R.R. shops	644	580	296
Built new—total	4,131	3,199	5,372
Rebuilt	159	186	410
TOTAL DELIVERED	**4,290**	**3,385**	**5,782**

ORDERED

To be built new by carbuilders	3,116	4,516	6,873
To be built new by R.R. shops	200	579	600
To be built new—total	3,316	5,095	7,473
To be rebuilt	0	0	500
TOTAL ORDERED	**3,316**	**5,095**	**7,973**

ON ORDER AND UNDELIVERED

	Nov. 1, '72	Oct. 1, '72	Nov. 1, '71
To be built new by carbuilders	16,010	16,386	22,426
To be built new by R.R. shops	3,812	4,256	3,437
To be built new—total	19,822	20,642	25,863
To be rebuilt	1,493	1,775	2,092
TOTAL ON ORDER	**21,315**	**22,417**	**27,955**



Source: Association of American Railroads

Moving People

TRANSIT DEVELOPMENT CORP. FORMED

The Transit Development Corporation, Inc., has been established in Washington as an independent, non-profit organization to engage in research and development activities. A spokesman for the Institute for Rapid Transit, which along with the American Transit Association assisted in organizing the new corporation, said "it is anticipated that certain R&D work now being performed by IRT and ATA will be transferred" to TDC. The corporation will "focus upon such problems as improving the transit environment—with specific investigation of noise reduction, ventilation and reduction of vibration, improvements in bus technology, and study of new types of guided rail vehicles." Chairman of the board of TDC is William J. Ronan, who is also president of the IRT and chairman of New York's Metropolitan Transportation Authority. John F. Hoban, of the Port Authority of New York and New Jersey, is acting executive director.

OFF-AGAIN-ON-AGAIN CTA BID IS OFF AGAIN

Bid opening for 100 new Chicago Transit Authority cars, originally scheduled for October and then cancelled and rescheduled for Nov. 30, has been cancelled again. This time, no new bid date has been set. CTA management is recommending to its board of directors that no action be taken on the purchase of new rapid-transit equipment until a consulting firm has had an opportunity to study the structural soundness of the equipment. In the aftermath of the Illinois Central Gulf commuter-train accident in Chicago that resulted in 45 deaths, Gov. Richard B. Ogilvie put a freeze on state funds earmarked to aid purchases of doubledecker commuter cars similar to the Highliners involved in the ICG accident. While this order did not affect cars of the CTA design, it was felt by CTA management that a study should be made of the structural integrity of the cars before proceeding with the purchase plans.

BAY STATE CHIEF OFFERS TRANSIT PLAN

Massachusetts Gov. Francis W. Sargent on Nov. 30 announced a $1.2-billion program designed to reject highway construction in favor of mass transit and rapid rail service. In a television address to the state, Gov. Sargent said Boston's expressways were chains imprisoning the city. Scrapping plans for a leg of Interstate 95 cutting through the city, he called for outlays of $800 million for rapid transit facilities to outer suburbs and the construction of parking lots at suburban terminals and $400 million for upgrading existing Penn Central, B&M, and rapid transit facilities.

WESTINGHOUSE DEFENDS BART DESIGN

Westinghouse Electric, which supplied automatic train control equipment for the Bay Area Rapid Transit System, told a California State Senate Committee that the design of the BART system is "as safe as or safer than any system now in operation anywhere in the world." Dr. Woodrow E. Johnson, Westinghouse vice president and transportation division general manager, appeared before the committee to reply to what he called "unwarranted conclusions" reached in a report by a state legislative analyst, A. Alan Post. The report sharply questioned some of BART's safety features. Dr. Johnson noted that the manual block procedure now used by BART resulted from a requirement imposed by the State PUC in August of this year, after completion of testing and prior to start-up of revenue service. But he emphasized that the trains are still under full automatic operation at all times, although they are sometimes held at certain stations by the manual block. "The basic question is whether the BART system is safe enough to warrant passenger service," he said. "We believe that no safer system has been designed and put into service."

C&NW GETS UP DIESELS FOR COMMUTERS

Eleven high-horsepower locomotives which started life in mainline passenger service will soon be earning their keep in Chicago & North Western suburban service. Eleven 2,250-hp units—Union Pacific power made surplus when Amtrak took over—have been acquired by C&NW and are now being overhauled and modified in the road's Oelwein, Iowa shops. All 11 are scheduled to go into service again in first-quarter 1973. The big units will replace 1,500-hp locomotives and, says North Western President Larry S. Provo, "will substantially strengthen our ability to maintain the high dependability and ontime performance of our suburban train fleet." Cost of the units to C&NW, including shop work, will be about $1.5 million.

$750-MILLION RAIL PLAN FOR N.Y., N.J.

The New Jersey Senate will hold hearings this week on two bills, already passed by the Assembly (House), that would permit the Port of New York and New Jersey Authority to undertake a $650-million rail transit program in the New York metropolitan area. Similar legislation will be introduced in the New York legislature early in 1973. Under present law, the Port Authority's rail participation is limited to operation of the PATH system connecting lower Manhattan and New Jersey. Among other things, the new program contemplates rail extensions to J.F. Kennedy and Newark airports.

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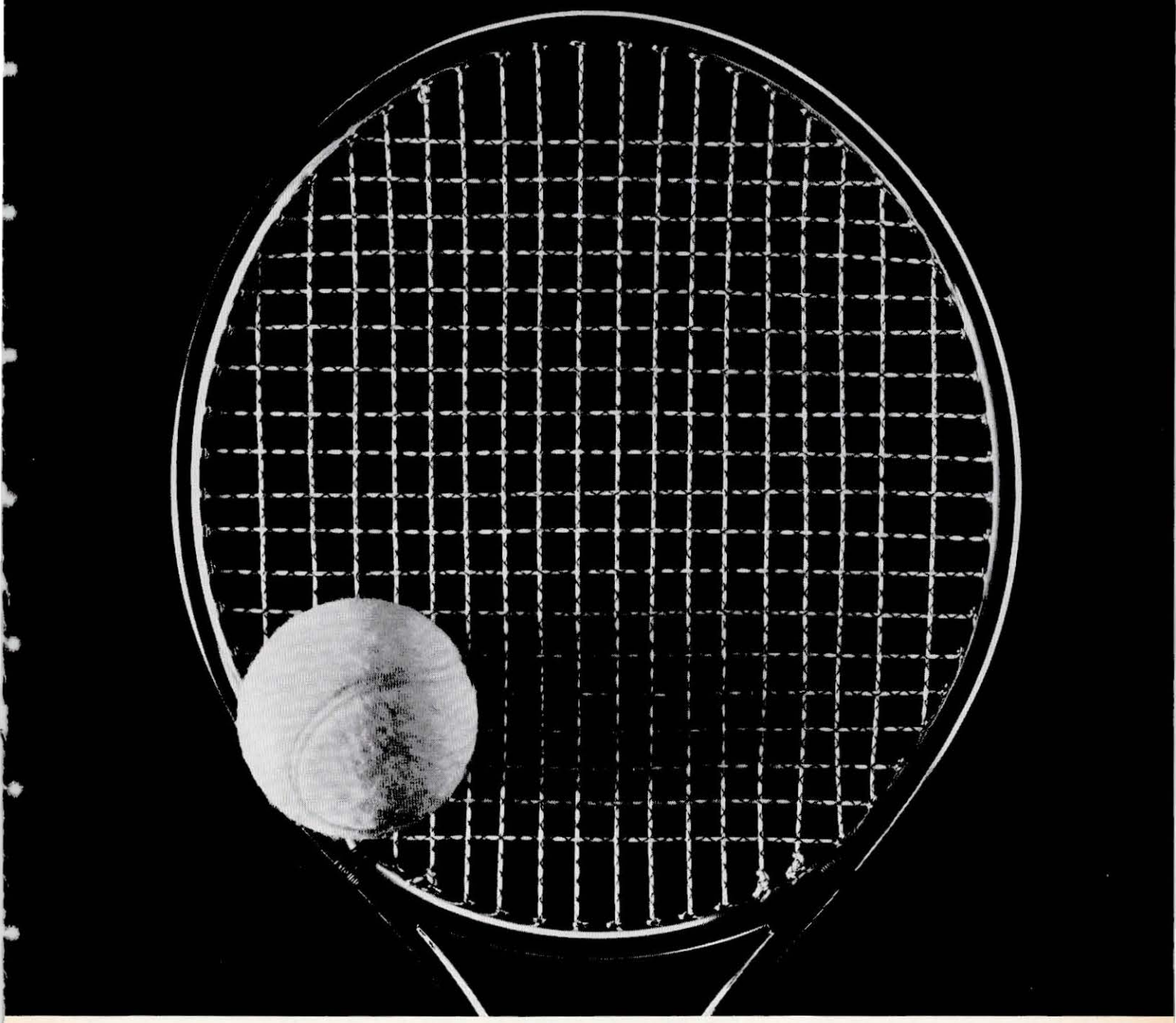

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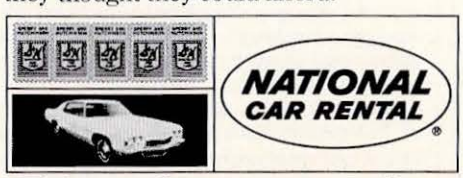

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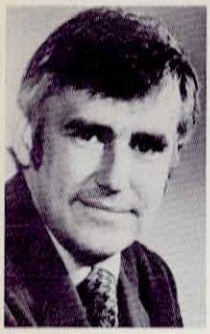
People in the News



Bruce M. Brown
Kerite

Harold L. Smith, Jr.
EMD

W.C. Cunningham
Alco Spring

V.J. Gruzdis
Alco Spring

ASSOCIATION OF AMERICAN RAILROADS.—**Emory F. Waldrop, Jr.,** director of legislative affairs, Washington, D.C. elected vice president in charge of the Legislative Department. **Patrick H. Mathews,** who has served as legislative vice president since 1969, elected vice president and assistant to the president. Mr. Mathews will work full time on special legislative projects.

BURLINGTON NORTHERN.—**John M. Budd,** chairman of the finance committee, retired Nov. 30.

Kenneth C. Sanders named to the newly created position of senior assistant vice president, marketing.

CHICAGO & NORTH WESTERN.—**Gilbert R. Gibbons,** director of materials-distribution, named assistant vice president-materials. **John R. Ewers,** materials control manager-system, appointed director of materials management. **George R. Frayn,** senior industrial engineer, becomes manager of purchasing.

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Sealed Proposals for the purchase of a self-propelled rail heater will be received by the Metropolitan Transportation Authority at the above address until 11:00 AM January 3rd 1973 at which time they will be opened and read in the presence of all Bidders desiring to attend. Persons wishing to bid may obtain a copy of the contract documents from the Authority, but requests must be in writing.

The Authority reserves the right to accept the proposals most advantageous to it and wave informalities in or to reject any and all proposals, as it may determine in its sole and absolute discretion.

WILLIAM J. RONAN,
Chairman and
Chief Executive Officer

DENVER & RIO GRANDE WESTERN.—**C.J. Dobol,** district manager, New York, retired Oct. 31 after 41 years of service. **W.T. Boettingheimer** appointed assistant to regional manager, sales and market development, New York. **W.E. Mullins** and **J.P. Heiney** named district managers, sales and market development at Baltimore, Md., and Cincinnati, Ohio, respectively.

FLORIDA EAST COAST.—**Lawrence D. Saggus** appointed district sales manager, Atlanta, Ga.

GRAND TRUNK WESTERN.—**Robert A. Walker,** former director, rate publication services, **Traffic Executive Association—Eastern Railroads,** New York, is now general manager-marketing, GTW, Detroit, Mich.

MISSOURI-KANSAS-TEXAS.—**John J. Miele,** sales manager, Milwaukee, transferred to Cincinnati, succeeding **Frank A. Honeycutt,** retired. **Frank Juse,** sales representative, Minneapolis, promoted to sales manager, Milwaukee.

NORFOLK & WESTERN.—**John L. Cowan,** treasurer, Continental Oil Co., Stamford, Conn., elected vice president-finance, N&W, Roanoke, Va., effective Jan. 1. He will succeed **Hamilton M. Redman,** whose title will be vice president until his retirement March 1, 1973.

A.W. Jenkins appointed director labor relations, Cleveland, succeeding **H. Odom,** granted leave of absence.

NORFOLK & SOUTHERN.—**Joel S. Cagle,** district sales manager, Charlotte, N.C., retired Oct. 31, after 47 years of service.

PENN CENTRAL.—**Donald W. Korn** named director-coal and ore sales, Philadelphia. **John F. Duink,** assistant coal and ore sales manager, Cleveland, advanced to coal and ore sales manager there and has been succeeded by **William D. Shell. George E. Thomas,** coal and ore sales manager, Cleveland, named coal sales manager, Pittsburgh. **Howard M. Johnston,** district coal agent, Pittsburgh, appointed assistant coal sales manager, Cincinnati.

Frank D. Abate appointed superintendent of equipment, Eastern Region, Philadelphia. Mr. Abate previously served as manager of passenger car maintenance at Philadelphia and superintendent of equipment, Northeastern Region, New Haven.

SEABOARD COAST LINE.—**Leonard A. McLean,** engineer car construction, named assistant chief of equipment engineering, Jacksonville, Fla.

James D. Trapp, Jr., appointed assistant chief engineer—staff, and **Robert I. Simkins** appointed engineer of bridges, both at Jacksonville.

SOUTHERN.—**Thomas C. White,** formerly with the public relations department, **Association of American Railroads,** has joined the Southern as senior writer. He will write speeches for Southern officials, in addition to other writing assignments.

SUPPLY TRADE

Bruce M. Brown has been named president, **Kerite Co.,** Seymour, Conn., succeeding **Franklin S. Harris,** who becomes chairman. Mr. Brown formerly was assistant to executive vice president, **Harvey Hubbell, Incorporated,** Bridgeport, of which Kerite is a subsidiary.

Harold L. Smith, Jr., chief engineer, **Electro-Motive Division** of **General Motors,** La-Grange, Ill., has been appointed general manager, effective Jan. 1, 1973. He will succeed **Boyd B. Brownell,** who is retiring after 37 years with GM. **Ludvik F. Koci,** chief locomotive development engineer, has been named to the new position of assistant chief engineer in charge of end product design and development. **Henry A. Marta,** truck and underframe engineer, succeeds Mr. Koci, and in turn is succeeded by **Kenneth D. Mels,** senior project engineer in the truck and underframe group.

W.C. Cunningham has been appointed president, **Alco Spring Industries, Inc. V.J. Gruzdis** has been named vice president-manufacturing. **Fred N. LaCorte** and **John W. MacDonald** have been named regional sales managers, Western Region and Eastern Region, respectively. Mr. Cunningham will also continue to head **Alco Industries Sales,** a division of Alco Spring Industries.

John P. Lynch, vice president, **Thrall Car Manufacturing Co.,** Chicago Heights, Ill., has been promoted to vice president-sales.

Ms. Elaine Hudanich has been promoted to sales manager, **Freight-Gard Division, Protective Plastics Co., Inc.,** Oakland, N.J.

Edward R. Boedeker has been named manager, Cargo Security Equipment Division of **Brammall, Inc.,** Angola, Ind. Mr. Boedeker was formerly president and general manager, **Litewate Transport Equipment Corp.,** Milwaukee, Wis.

Robert Minnick has been named to head the new Cargo Systems Division of **Kornylak Corp.,** Hamilton, Ohio. He formerly headed the Road Division of Koehring, Springfield, Ohio.

OBITUARY

Rudolph N. Edman, 69, retired chief statistician, **Milwaukee,** died Nov. 19 in Wesley Memorial Hospital, Chicago.

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Viewpoint

Needed: Uniformity in environmental requirements

Any objective study of the relationship between railroads and the environment shows a couple of things pretty clearly. One is that environmental interests will be quite a bit better served if railroads are able to—or are allowed to—increase their share of the intercity freight-traffic market. Another is that sooner or later—and the sooner the better—government's environmental-control system will have to begin speaking with a single voice.

There is—or at least there has been—no argument with the fact that per unit of work performed the railroad comes off best on just about any measure of environmental impact. The question is whether transportation policy will be structured in a way that will encourage transportation users to put their business with the transportation mode that protects the environment best—assuming, of course, that the quality of service provided also justifies a pro-rail decision on the part of the customer.

Just as important, however, is the question of which way—not ways—government will move in its handling of ongoing environmental regulations. This concern could be expressed in many ways. What it boils down to is a pressing need for stability—in the regulations themselves and in the regulators' attitude toward enforcement. Southern Pacific perhaps sums it up best, so far as the regulations are concerned: "Among the problems we see is the fact that in many areas of pollution-control, standards are something of a patchwork puzzle. As an interstate carrier, we feel it is a matter of extreme urgency that pollution-control standards be made nationally or for large regions, so that there is uniformity among the requirements which we must meet." As for the regulatory attitude, that too may leave something to be desired. An environmental expert was talking about his observation of three states: "State A, they'll talk things over and I really think they want to be practical. State B, they seem to want to show their enforcement muscle. State C? They not only don't want to talk, they don't even want to listen."

A JOB FOR THE FEDERAL GOVERNMENT

Rather clearly, some element of government—and it can only be Federal—will have to take charge, pre-empting, and providing the needed stability. As matters stand, most railroads seem to be bending over backwards to demonstrate their good citizenship—but there are coming to be more and more cases where the good citizenship is simply too costly. One railroad's environmental officer makes his position clear: "We do not object to providing facilities that are reasonable for controlling pollution. However, we feel strongly that some of the demands and requirements of state agencies have reached unreasonable proportions and are more politically-oriented than aimed at serving useful purposes."

There are more than a few ironies in the whole situation. Railroads, so often kicked around for allegedly ignoring their public responsibilities, are up with industry's leaders in accepting—even volunteering for—environmental responsibility. They deserve credit for their positive action. What they—and other industry—don't deserve is a new kind of kicking around, with governments competing for a "most-restrictive" award. And while you may hate to see the Feds taking full charge in another area—well, sometimes there's no other way.

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